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MARCH, 1925

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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association Northern Minnesota Medical Association and Minneapolis Surgical Society

VOL. VIII MARCH, 1925 No. 3

ORIGINAL ARTICLES

HEPATIC FUNCTIONAL TESTS IN EXPERIMENTAL JAUNDICE*

ALBERT M. SNELL, M.D.
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During the past year a group of men in the Mayo Clinic has been interested in developing and testing a number of methods for the clinical determination of hepatic insufficiency. Since the liver is an organ of manifold functions, a great many tests have been devised which deal with these individual functions. Many of these methods are of doubtful value; others have interesting possibilities and appear promising from the clinical standpoint. It seems very unlikely that any single test will ever be able to measure the sum of all the activities of the liver. Dr. Greene and I have recently studied a number of the more promising tests for hepatic function in cases of experimental obstructive jaundice with a view to determine the value of the various tests under controlled conditions, and to provide an experimental background for the interpretation of the functional deviations observed in patients with obstructive jaundice. Among the tests used by us were those for carbohydrate tolerance, the nitrogen partition of the blood, the Widal hemoclastic crisis, coagulation factors, blood fibrin and calcium, the hemoconia test of Brulé, the quantitative determination of serum bilirubin by van den Bergh's method, and the phenoltetrachlorphthalein test of Rowntree and Rosenthal.

The relation of the liver to carbohydrate metabolism has been appreciated since the time of Claude Bernard. Recently Mann has demonstrated in hepatectomized animals that the liver is essential for the maintenance of a normal blood sugar level. On theoretic grounds it would seem that the ideal clinical test for hepatic function would be one which determined the ability of the liver to assimilate carbohydrate. Since the classical experiments of Sachs on liverless frogs, fructose has been the most approved sugar for this purpose. It is believed that this sugar is rapidly absorbed from the alimentary canal, and after its conversion to glucose, is stored by the liver. During the whole process no significant rise in blood sugar occurs. Theoretically, therefore, if the hepatic parenchyma is damaged, the ingestion of fructose should cause a sharp rise in blood sugar.

In animals with experimental obstructive jaundice, positive fructose tolerance tests occur about the sixth day after the occlusion of the common duct; thereafter, these tests remain positive until the death of the animal. Occasional negative tests are found, but in general the ability of the organism to assimilate fructose is greatly reduced in this condition.

Fructose tolerance is also diminished in other types of toxic injury to the liver. Bodansky in particular has used the newer methods of studying sugar tolerance, and has demonstrated definite changes in chloroform, phosphorus, and hydrazine poisoning.

The clinical application of such experimental findings is difficult. There are numerous factors, such as pituitary, pancreatic and other endocrine disorders, which must be considered in any case in which the ability of the organism to metabolize carbohydrate is reduced. Judd has particularly emphasized the frequent association of surgical evidences of pancreatitis with disease of the biliary tract.

In our study of the test in patients with obstructive jaundice, we have not been able to show specific changes which could be definitely ascribed to hepatic damage, per se. Our clinical experience with other diseases of the liver has been similar. In general, we feel that while fructose tolerance tests are valuable from an experimental standpoint

*Read before the Minnesota State Medical Association, St. Cloud, October, 1924.

they are of questionable importance in the diagnosis and treatment of the individual patient.

The liver is likewise known to be the seat of much of the intermediary nitrogen metabolism of the body. Frerichs was one of the first to recognize the importance of the finding of crystals of the amino-acids, leucin, and tyrosin, in the urine of patients with acute yellow atrophy. During the past two decades much has been written concerning urinary nitrogen partition in hepatic disease. Rowntree, Marshall and Chesney have emphasized the difficulty of interpretation in such studies, and have called attention to the accompanying changes in the blood; they found that the normal proportion of blood urea was decreased in hepatic disease. More recently, Bollman, Mann and Magath have reported evidence of diminished urea formation in dogs following the complete extirpation of the liver. In our experimental animals there was usually a sharp and definite decrease in both the proportionate and absolute values for blood urea following the induction of obstructive jaundice. These low values persist until shortly before the death of the animal, when a terminal rise of blood urea occurs. This is probably an evidence of terminal renal insufficiency; in this respect the condition in experimental animals is comparable to that described by Walters and Parham in patients dying of obstructive jaundice. Other nitrogenous constituents of the blood showed no change worthy of particular mention.

Blood urea estimations in a series of forty patients with obstructive jaundice gave results somewhat below the average normal limits. The decrease, while indicating the possible similarity of the change to that seen in experimental animals, was not sufficiently marked to be of diagnostic value in the individual case.

The hemoclastic crisis of Widal has recently been put forward as a clinical test for the proteopexic activity of the liver. This test is based on the theory that a normal hepatic parenchyma is essential to the production of the so-called digestive leukocytosis. In the presence of hepatic disease, a leukopenia should follow the ingestion of a protein meal, and to this phenomenon the term hemoclastic crisis has been applied. We have employed the test both clinically and experimentally, and have not been able to establish its diagnostic value.

An increase in the ultramicroscopic blood fat particles, or hemoconia, after a fat meal, has been used by Brulé as an index to the presence of bile salts in the intestine. With biliary obstruction this normal increase does not occur. It is obvious that this test gives results roughly comparable to an examination of the stools for bile. French clinicians particularly have emphasized the importance of this test in determining the presence or absence of common duct obstruction, and our clinical and experimental studies have in general given confirmatory evidence on this point.

The formation and excretion of bile are characteristic activities of the liver. Since the most striking hepatic disorders are those accompanied by retention of bile and consequent jaundice, much attention has been paid to the presence of bile pigments in the blood, urine and feces. As has been repeatedly shown, bile retention damages the hepatic parenchyma, the amount of destruction being very roughly proportionate to the degree and duration of this retention.

It is quite natural, therefore, that the pioneers in the field of hepatic physiology should have attempted to demonstrate the bile pigments in the circulating blood, and in the urine. A century ago Tiedeman and Gmelin reported the presence of a color reaction produced by the addition of nitric acid to the blood serum of a patient with jaundice (Gmelin's test).

Recently various attempts have been made to measure the bilirubin content of the serum. The simplest methods have been based on the theory that the intensity of the serum color is an index to the quantity of bilirubin, since the latter is the chief pigment of blood serum. A colorimetric comparison, using a 1: 10,000 solution of potassium bichromate as a standard, has been widely used, the readings being termed the "icterus index." This method is quite satisfactory for following variations in the degree of frank icterus, but difficult of application in conditions in which the serum bilirubin is only slightly increased. Confusion may also arise through the presence of xanthophyll and carotinoid pigments in the blood. These substances may be present in sufficient amounts in carotinemia to cause frank skin discoloration. By modifying the original Gmelin's test, a number of attempts have been made to produce green or blue oxidation products of bilirubin under conditions permitting quantitative estimation of the amount of color developed. These methods have in general been disappointing, and it remained for van

den Bergh to develop the wholly satisfactory test which bears his name.

The simplicity of this procedure commends it for general clinical use. Ehrlich's diazo-reagent is added to blood serum or plasma; the immediate development of a violet tint is termed a "direct" reaction. The proteins are then precipitated by the addition of alcohol, and a definite rose-pink color develops in the supernatant fluid. This phase of the test is termed the indirect reaction. Van den Bergh has claimed that a direct reaction is diagnostic of obstructive jaundice. However, there are serious theoretical and practical objections to this point, and in my opinion no such sharp differentiation is possible. The quantitative measurement of serum bilirubin can be made by comparison with an inorganic standard, the color of which corresponds to a 1: 200,000 solution of azobilirubin.

Bilirubin is not a normal constituent of dog serum. It appeared in the blood of these animals in increasing amounts after ligation of the common duct; large quantities were not found until forty-eight hours or more after operation. These values increased gradually after the first two weeks, and then remained constant until death. In animals with cholecystectomy and ligation of the common duct, bilirubin appeared in the serum in large amounts within twelve to twenty-four hours after operation. Usually a secondary fall occurred, with a subsequent rise, the level thereafter remaining constant. Clinical icterus usually appeared at the same time as the first direct van den Bergh reaction and deepened somewhat during the latter part of the postoperative course. Mann and Bollman have previously demonstrated the delayed appearance of jaundice in consequence of the presence of the gallbladder, ascribing the phemonenon to the concentrating activity of this organ.

The quantitative determination of serum bilirubin is of great clinical value. Normally human blood contains from 0.5 to 2 mg. for each 100 c.c.; in cases of obstructive jaundice of long duration, concentrations of serum bilirubin only slightly less than those found in fistula bile have been observed. The level of this pigment in the serum does not parallel the amount excreted in the urine, and neither can this level be estimated with certainty from the degree of skin or scleral discoloration.

From an experimental standpoint the test is of greatest importance in estimating the amount of bile retention in cases of obstructive jaundice, and in following the course of jaundice due to any cause.

The phenoltetrachlorphthalein test for hepatic function is based on the fact that a normal liver rapidly removes this dye from the blood stream after its intravenous injection. If the liver is diseased this removal is accomplished much more slowly, and by estimating the amount of dye in the blood serum at measured intervals after its injection, the degree of dye retention may be established.

Following the ligation of the common bile duct in dogs, no retention of phenoltetrachlorphthalein was observed until the second or third day following operation. The development of distinct dye retention usually coincided with the first marked appearance of bile in the blood. Thereafter the amount of dye retention gradually increased, running parallel with the degree of bile retention until the death of the animal.

In animals with cholecystectomy in addition to common duct ligation, dye retention was found within twenty-four hours after operation. Here, too, a close parallelism with the amount of serum bilirubin was observed, both the bile pigment and the dye showing high grades of retention on the first day after operation. Animals in this group were much more affected by their biliary obstruction than those with simple ligation of the common duct, and jaundice appeared clinically at an earlier date. A secondary fall and subsequent rise in both bilirubin and dye retention was the rule in these animals, the curves, however, tending to become constant after the third week.

DISCUSSION

The pathologic changes in the liver following biliary obstruction are well known. The functional disturbances indicated by the changes in certain of the tests studied are scarcely less striking. Several of the tests failed to show definite changes, implying either that these tests are not specific, or that the changes incidental to the obstruction were not sufficiently great to permit of their demonstration by these methods. The liver is an organ with a large factor of safety. A considerable proportion may be removed without disturbing normal physiologic activity. It is not surprising, therefore, that marked changes in the major functions relating to carbohydrate and protein metabolism are difficult to demonstrate.

Unfortunately no adequate clinical method for the study of bile acid metabolism is as yet available. Such a method would be of great value, for further data on this point are most desirable. The bile acids apparently are formed solely by the hepatic parenchyma, whereas the bile pigments, in part at least, are probably formed elsewhere and brought to the liver for excretion.

The studies in the serum bilirubin show the usefulness and value of this test in following the progress of jaundice. Equally significant is the close parallelism in these experiments between the amount of serum bilirubin and dye retention. Apparently the dye is always retained when there is bile retention from any cause. Whether this is due to functional or structural damage to the liver cells from a toxic action of bile, a mechanical impediment due to an overload on the hepatic filter, or to some other factors as yet unknown, cannot be definitely stated. Conclusions regarding the physiologic activity of the liver certainly should not be made solely on the basis of studies such as this. The changes shown by certain hepatic functional tests appear to be significant from the clinical standpoint, and further work along these lines may aid in the evolution of more sensitive and satisfactory tests of the integrity and functional efficiency of this organ.

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Note: For discussion of this paper and the one following, see page 144.

FUNCTIONAL TESTS IN HEPATIC DISEASE*

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In the past the most striking advances in the application of functional tests to clinical medicine have been made in the study of renal diseases. The kidney is preponderantly an excretory organ, and consequently peculiarly suitable for functional study. Both the initial material, the blood, and the excretory product, the urine, are readily available for analysis. The clinical study of the activities of the liver is much more difficult, for this is an organ of manifold functions, and our knowledge of the physiology is in many instances woefully inadequate.

The liver is concerned primarily with the blood borne to it by the portal vein; this blood comes from the abdominal viscera and contains many substances not present in the general circulation. The bile cannot be directly collected for study, and the material obtained by duodenal drainage is mixed with an unknown amount of intestinal content. The approach to the functional study of the liver, therefore, must be indirect and correspondingly difficult.

The physiologic experiments of Mann have emphasized the fact that bile pigment may be formed outside the liver, to be excreted by that organ. From both the physiologic standpoint and that of clinical usefulness, an analogy may be drawn between the study of serum bilirubin in hepatic disease and of blood urea in renal disease. We have pointed out the convenience of the test in following the changes in experimental obstructive jaundice in animals.[3] It is of equal clinical usefulness (1) in estimating the amount of bile retention in patients with obstructive jaundice, (2) in giving a quantitative index to the degree of jaundice in the various toxic or infectious types, (3) in following the course of jaundice due to any cause, and (4) in demonstrating the presence of a latent icterus. In the latter connection a number of concrete diagnostic applications may be mentioned. In pneumonia, exophthalmic goiter, the toxemias of pregnancy, or following the administration of chloroform or arsphenamin, high bilirubin values predict the onset of toxic icterus with its grave prognostic im-

*Read before the Annual Meeting of the Minnesota State Medical Association, St. Cloud, October 8-10, 1924.

port. In cardiac disease, emphysema, or hypertension, rising levels of serum bilirubin presage passive congestion of the liver due to myocardial failure. In secondary anemias, excepting those of hemolytic origin, normal bilirubin values are the rule. For example, in differentiating between occult carcinoma and pernicious anemia, a high figure would argue for the latter diagnosis. However, in known carcinoma, elevation of the bilirubin value may often indicate metastatic involvement of the liver or biliary passages.

Serum bilirubin determinations are most valuable in the differential diagnosis of abdominal colics. As pointed out by Smithies,[2] less than a third of all biliary colics are followed by manifest icterus. Diagnosis may be extremely difficult in the remainder, which are not associated with jaundice.

Following such a colic the serum bilirubin is elevated, although not to a degree or for a length of time sufficient to color the skin or scleræ. The demonstration of latent icterus in such cases is diagnostic. We have also seen a few acute cases with severe but unlocalized abdominal pain, in which the finding of a serum bilirubin considerably above the normal has served to identify the source of the trouble.

The use of the dye, phenolsulphonephthalein, in the testing of renal function, is familiar to all. A further analogy between functional testing of the liver and kidney perhaps may be shown in the use of a closely related dye, phenoltetrachlorphthalein, in the study of liver disease. After intravenous injection, this dye is taken up from the blood stream by the liver and excreted in the bile.

Originally introduced into clinical medicine by Rowntree, Hurwitz, and Bloomfield, the attempt was first made to measure the excretion in the stools. Later the collecting of bile by a duodenal tube was substituted. Neither method was wholly satisfactory for routine clinical use. Rosenthal substituted the study of the rate at which the dye left the blood stream. In hepatic disorders the rate of dye removal is greatly reduced and changes are readily shown. It is the clinical use of this modified test, the Rowntree-Rosenthal test, that I will discuss.

The technic of the test is simple. The solution of the dye may be obtained in ampules. One cubic centimeter of this solution is injected intravenously for each 22 pounds of body weight. Fifteen minutes, one hour, and two hours later, blood samples are taken, 5 c.c. at each time being ample. The clear serum is separated, a drop of alkali is added to bring out the color of the dye, and comparison made with standard tubes. Normally the dye is rapidly removed from the blood stream. At the end of fifteen minutes only 5 to 7 per cent remains, while at the end of an hour only traces of dye are present. In patients with obstructive jaundice, as much as 30 per cent of the dye may still be present in the blood stream, two hours after the injection.

We have demonstrated the experimental changes observed in dogs following ligation of the common bile duct. Bile retention promptly occurs in such animals, the time at which jaundice appears depending on the presence or absence of the gallbladder. These dogs have a progressively increasing degree of dye retention, which closely parallels the increase in the serum bilirubin. The changes observed in patients are quite similar.[4] A series of about forty cases of obstructive jaundice due to stone or postoperative stricture of the common duct have been studied at the Clinic. Cases of cholecystitis without jaundice showed only the slightest degree of dye retention. With the development of jaundice, the changes in the phenoltetrachlorphthalein test became definite and characteristic. In all cases there was a marked retention of dye in the blood stream. As in dogs with experimental obstruction of the common bile duct, the degree of retention of dye roughly corresponded to the degree of retention of bile pigment.

Following the operative relief of the obstruction in these patients, there was a rapid decrease in the serum bilirubin and the degree of dye retention. The serum bilirubin speedily returned to normal. Following the first decrease, however, the phenoltetrachlorphthalein test often showed a moderate but persistent degree of dye retention. This possibly is related to the residual hepatitis observed in nearly all individuals with obstruction over any extended period of time.

The changes observed in the other clinical varieties of icterus were quite similar to those seen in obstructive jaundice. In acute infectious or catarrhal icterus, in toxic jaundice whether associated with syphilis and treatment with arsphenamin, with pneumonia, or exophthalmic goiter, and in acute yellow atrophy of the liver, marked dye retention is present. Again the degree of dye retention closely parallels the increase in the serum bilirubin. In such cases icterus is the outstanding

fact, and it dominates both the clinical picture and the laboratory findings.

The dye test, however, is of greatest clinical value in the study of those cases of hepatic disease in which jaundice is not a factor. The obstetricians have already applied the test in the differentiation of the toxemia of pregnancy from neurotic vomiting and eclampsia of nephritic origin. In this condition the dye test apparently will show changes before the serum bilirubin increases markedly. In carcinoma of the gastro-intestinal tract, normal readings are obtained before extension of the growth begins. Moderate retention was found in a series of ten cases of carcinoma of the stomach or colon without jaundice. On opening the abdomen, the surgeon found obvious metastasis to the liver in eight of these patients, and in one of the others there was widespread glandular involvement. The degree of dye retention depends in part on the extent of the malignant process in the liver, so that a normal test will not positively exclude the presence of small metastasic nodules.

In cirrhosis the test shows definite changes, although the correlation of laboratory findings with the clinical picture must be made with care. In biliary, syphilitic, and atrophic cirrhosis, the finding of dye retention has definite diagnostic and prognostic value.

The various functional tests add but little from the standpoint of the differential diagnosis of hepatic diseases. This perhaps is to be expected, for experience with the use of renal function tests has likewise demonstrated that functional changes are not necessarily characteristic of the particular etiologic agent. The liver is an organ with a large factor of safety. Experimentally a large proportion of the liver can be removed, and the remnant still be adequate for normal function.

Again, disturbance in one type of physiologic activity does not indicate similar disturbance in others. The presence of a normal serum bilirubin and the absence of dye retention will not exclude hepatic disease. Positive tests, on the other hand, are of great value in indicating the probable presence of definite and widespread hepatic disease. Hence, although the present hepatic functional tests are not ideal, their introduction marks another milestone on the road to the better understanding of diseases of the liver.

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DISCUSSION ON THE TWO PRECEDING PAPERS

(DR. SNELL AND DR. GREENE)

DR. TUOHY (Chairman): In a discussion the other day, a well known surgeon from Chicago stated that the newer physics are always faster, and one of the bystanders stated that perhaps it was safer to stick to mineral water. Now, it is doubtful whether we have anybody competent to analyze the situation from the newer physics standpoint, but I notice Dr. Mayo in the audience, and I wonder if he will not give us some ideas.

DR. WILLIAM J. MAYO, Rochester: Mr. Chairman, I think we are all interested in the question of the function of the liver. When patients die following surgical operations we habitually try to classify the deaths in relation to the four vital organs. We know that people must die, the lungs give out most easily, and in the majority of cases we consider them the executioner. Next to the lungs as the cause of death we place the kidneys. In a small number of cases, the brain appears to be the final lethal agent, and in the least number of all, the heart is blamed.

Today we know just enough of hepatic function to look on the liver as a vital organ. We know that the process of life is one of oxidation, that the red-blood cell is the carrier of oxygen, and we can say, in a general way, that the red cell comes from the bone marrow. We know, too, that the white cell comes from the reticulo-endothelial system and that its chief function concerns repair and defense. We can say that the blood platelets are derived from the megakaryocyte cells in the bone marrow and are concerned, among other functions, with the clotting of the blood. All these formed elements of the blood can be studied with the microscope. We speak of the blood plasma as a liquid medium which carries these formed elements, yet how little we know about this fluid which lies in the ultramicroscopic field. The physicist has approached his problems through the ultramicroscope as an aid to the eye, because it is the eye which brings us the true information, and we are now in a field beyond its power to see, even with the microscope, which does not enable visualization beyond 1/10 micron or 1/250,000 inch. Those particles of matter which are from 1/10 micron to 1/1,000 micron,

1/25,000,000 inch, are called colloids. The colloid particles are too small to be seen directly, but they are large enough to scatter a ray of light, and they therefore refract the light ray, under the ultramicroscope. Beyond the field of the ultramicroscope lies the molecular and atomic field which has so far been analyzed experimentally by the electromagnetic vibrations of the *x*-ray, which is only 1/100,000,000 inch in length.

The blood plasma in a general way has its origin in the action of the liver on the contents of the portal vein. The products of the metabolic processes of the liver which concern the fundamental nutrition of the body and the elimination of waste products are all colloid and molecular substances, and are contained in the blood plasma.

Through the work of Greene, Snell and Walters, reported at this meeting, we have reliable tests of liver function. We begin to get an idea of the damage done by materials imperfectly metabolized in the liver circulating in the blood, to the so-called vital organs, the lungs, the kidneys, the brain, and the heart, causing them to act as executioners.

Consider jaundice, for instance. My colleague, Dr. Hallenbeck, first started profitable research work with the view of rehabilitating the blood of patients with jaundice to insure proper clotting following operation. Dr. Walters, acting on the suggestion of Lee and Vincent, began the intravenous injection of chlorid of calcium, and thereby the deaths in jaundice patients were reduced to less than one-fourth.

Further, as a result of the Rowntree-Rosenthal test of liver function through the elimination of injected dyes, we can know before operation the functional capacity of the liver, and can take measures to rehabilitate it. We surgeons are vitally interested in this work.

DR. WALTMAN WALTERS (Rochester): These parallel tests of hepatic function which have been reported by Doctors Greene and Snell are interesting not only to the clinician but to the surgeon, since it has been possible to use the Rowntree-Rosenthal test in estimating the surgical risk of patients with obstructive jaundice. For years the operative mortality in cases of obstructive jaundice has varied from 10 to 15 per cent. Indeed a surgical mortality of 30 per cent has been reported by some surgeons following operations on jaundiced patients. Following a method of pre-operative preparation first begun at the Mayo Clinic by Hallenbeck, and extended by Giffin, Bell and myself, the mortality rate on jaundiced patients following operation has been reduced approximately to 4 per cent. This method of preparation was described before the Section on Surgery of this Association in 1922.

Careful analysis of the causes of death of the 4 per cent of patients with obstructive jaundice who do not recover following operation, reveals the fact that the majority of them die from renal insufficiency as a result of failure adequately to relieve the obstruction in the common duct at the time of operation. Besides these patients there are some who present a clinical picture following operation entirely different from that of renal insufficiency; a syndrome which Parham suggests may be due to hepatic insufficiency. The practical value of the Rowntree-Rosenthal test is applicable to the latter group of patients, for it enables the prediction of the approximate amount of hepatic damage prior to operation, thus affording information of value.

DR. CARL HARTLEY GREENE (Rochester): Mr. Chairman, this is indeed an interesting subject, as shown by the recent symposium before the British Medical Association where some of these points were discussed in greater detail than has been possible here. The serum bilirubin and the phenoltetrachlorphthalein test show changes in different phases of the activity of the liver. Each is valuable, but in final analysis decision should be made on the basis of the combination of the two tests, rather than on either one alone. The differences between some of our conclusions and those of Rosenthal and others using the dye test exclusively may be explained by this means.

We should study subjects of this sort from a physiological point of view, from a pathological point of view, from a laboratory point of view, from a surgical point of view, and from a clinical point of view. It is only by a combination of these different lines of attack that medical problems as complicated as these may be solved.

COLLOIDAL GOLD NOT ACCEPTED FOR N. N. R.

"Colloidal Gold" (Kahlenberg-Klaus Co.) is claimed to have been developed by Professor Louis Kahlenberg, of the University of Wisconsin, and Dr. Edward H. Ochsner, of Chicago. The chief advertising matter is a circular which states that the remedy "has proved to be far superior to *x*-ray and radium in the treatment of inoperable cases of cancer and also as post-operative treatment." The solution is claimed to contain one one-thousandth of one grain of pure gold in colloidal form in every ten drops. The remedy is sold in four-ounce bottles at $5.00 per bottle. Calculation shows that the value of the gold in a bottle is less than one cent. In response to a letter from the Council on Pharmacy and Chemistry asking for evidence to substantiate the claims for the preparation, the manufacturer referred to an article by Dr. E. H. Ochsner. The article contains reports of four cases. In but one of the four cases was the diagnosis proved by microscopic examination and death from cancer indicates that the colloidal gold had no effect on the disease. In the other three cases there was no microscopic examination of the tumor. Every surgeon and pathologist of wide experience knows how misleading the gross appearance of tumors may at times be. It is almost inconceivable that a serious investigator of a method of treating cancer should have neglected such an obvious and simple means of controlling his work. Until more critically studied cases, supported by microscopic examination of the tissues, are reported, in which there has been definitely demonstrable retrogression or disappearance of the tumors, the Council on Pharmacy and Chemistry sees no reason for believing that "Colloidal Gold" offers anything more in the treatment of carcinoma than do the other colloidal preparations that have preceded it. The Council found "Colloidal Gold" inadmissible to New and Non-official Remedies because the claims advanced for it are unwarranted. (*Jour. A. M. A., Jan. 31, 1925, p. 387.*)

SURGICAL SIGNIFICANCE OF HEPATIC FUNCTION*

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In order to study hepatic function in disease it is necessary to bear in mind the more important physiologic activities of the liver in health, for it is from these that we form our measure of comparison in disease. In contrast to the kidneys the liver has many functions. Consequently no one test of hepatic function will obtain the same degree of accuracy as the tests of renal function, and yet it is perfectly possible to obtain an approximate comparative estimation of such function by a single test. The test, to be of practical value, must be simple, and, in a histopathologic comparison of hepatic tissue, show a definite proportion of increased or decreased hepatic function.

It has been determined, both experimentally and clinically, that the Rowntree-Rosenthal tetrachlorphthalein test most nearly meets the foregoing requirements. In this test 5 mg. for each kilogram of body weight of the dye is injected intravenously. An hour later 5 c.c. of blood is drawn from one of the superficial veins, and the dye remaining in the blood serum is compared with standard solutions containing various known amounts of the dye. This comparison allows the determination in percentage of the amount of dye in the blood serum; normally but 3 per cent of the dye should remain in the blood serum at the end of one hour, and none at the end of two hours. Snell, of the Mayo Foundation, using the Rowntree-Rosenthal tetrachlorphthalein test in experimental animals in which obstructive jaundice had been produced, has clearly shown that as jaundice progressively deepens the tetrachlorphthalein retention in the blood increases. During the course of some of his experiments on animals the obstructive jaundice has been relieved surgically, and with the decrease in jaundice there has been a proportionate decrease in the dye retention in the blood. Those interested in the quantitative determination of jaundice in patients and in animals can make it accurately by the van den Bergh method of measuring the amount of bile pigment in the blood serum. As one would expect, with an increase in jaundice, there is an increase in bile pigment in the blood, and with a decrease in jaundice, a decrease in the amount of bile pigment in the blood. A comparison between the amount of bile pigment in the blood and the retention of the tetrachlorphthalein dye in the blood stream shows the same ratio; namely, the greater the jaundice, the greater the amount of bile pigment in the blood, and the greater the retention of the phenoltetrachlorphthalein in the blood stream.

Counseller, of the Mayo Foundation, studying sections of liver from jaundiced animals, and specimens of liver removed at operation from patients with obstructive jaundice, believes that there may be a definite ratio between the number of abnormal hepatic cells and the amount of retention of the tetrachlorphthalein in the blood stream.

It seems reasonable to believe that tests of the glycogenic or sugar-storing function of the liver might serve also as an index of hepatic function. Attention was first called to such a test in 1901 by Strauss, who gave 100 gm. of levulose by mouth to patients with hepatic disease and found that levulose appeared in the urine of 90 per cent because the diseased liver could not store or utilize the entire amount. Churchman, using this test, obtained a positive test of impaired hepatic function in 25 per cent of normal subjects. Improvement in biochemistry, permitting quantitative estimations of blood constituents, has enabled us to extend our knowledge of such organs as the kidney, liver and spleen, which heretofore depended on laborious and inaccurate methods of collecting the excretory and secretory products from these viscera. Bodanski, studying blood sugar in animals, has found the levulose test to be of value. Snell has obtained a positive levulose test for liver dysfunction in dogs with obstructive jaundice, which appears on the sixth day following obstruction of the common duct and continues until death. Greene, using the levulose test on patients with obstructive jaundice, decided that the test was of little value because of variable results in similar cases, possibly due in part to the fact that patients with obstructive jaundice have variable unmeasurable changes in the pancreas tending to upset sugar equilibrium.

The exact rôle of the liver in the metabolism of proteins is not well understood. Mann has shown that on removal of the liver there is a decrease in

*Read before the Minnesota State Medical Association, St. Cloud, October 8-10, 1924.

the amount of urea in the blood. In our experiments on animals with obstructive jaundice it was noted that the amount of urea in the blood was within normal limits. The same is true of patients with obstructive jaundice until just before death, when, with the advent of renal insufficiency, a rise in blood urea occurs, a point to which Parham directed attention in 1922.

Unfortunately, we have as yet no method of measuring accurately the amount of bile salts in the blood, but are looking forward to the time when such a test will be found.

In a comparative study of these various tests of hepatic function of more than 100 patients and twenty-five dogs with obstructive jaundice, made by Snell, Greene and Counseller, the Rowntree-Rosenthal test has proved itself to be of practical value.

The surgical value of tests of hepatic function is self-evident. During the last three years approximately 150 patients with obstructive jaundice have been successfully prepared for operation at the Mayo Clinic by the method described in 1921, of preventing postoperative bleeding by intravenous injections of calcium chlorid, which has lowered the former operative mortality from 9 to 3.5 per cent.

The 3.5 per cent of patients with obstructive jaundice who die after operation, die, in most instances, from a terminal renal insufficiency, due to failure to relieve the common duct obstruction adequately at operation. A few of this group, however, do not die from terminal renal insufficiency, but from a syndrome which Parham described as hepatic insufficiency.

I believe that the Rowntree-Rosenthal test of hepatic function, and the van den Bergh test of the amount of bile pigments in the blood, will afford valuable aid in formulating surgical judgment, and in managing patients with obstructive jaundice. It is only a start, but a running one, in the study of hepatic function.

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DISCUSSION

DR. A. A. ZIEROLD (Minneapolis): The matter of liver function which Dr. Walters presented to you is, as he told you, not completely or adequately worked out as yet, because of the first difficulty in determining exactly the function of the liver. It struck me in listening to him that it was still a question of what function tetrachlorphthalein represented, and that probably it was more nearly a test of liver damage than it was a test of liver function, inasmuch as it paralleled the excretory mechanism of the liver. As I recollect, Snell and Greene paralleled the excretion of tetrachlorphthalein with the excretion of bile. If that is the case it is a question whether it is of any greater value in obstructive jaundice than the simple van den Bergh which shows the bile concentration in the blood serum. In this regard I would like to mention the work of Dr. McCartney in the Department of Pathology at the University of Minnesota relative to obstruction and jaundice. He says, largely upon work that he had done and I believe some work that Dr. Bell had done previously, that there was almost a parallel between the degree of obstruction and the amount of liver damage.

One thing I would like to ask in relation to the tetrachlorphthalein is whether it has served so far as a differential point between those cases of jaundice that are purely obstructive and those that are not essentially obstructive jaundice; that is, can you differentiate between hemolytic and obstructive jaundice? There it would seem to me of value in the early type. In going over some of Rosenthal's work and some of the subsequent work that has been done with this dye, it seems that the cases in which the tetrachlorphthalein would be of greatest value are the early cases, and unfortunately, like most cases of laboratory examination, in the early cases and in the border line cases the factor of error is the largest—that is, the elimination of dye in the first hour is the time when variation is the largest—and as far as I am able to learn the limits of

normal variation in this period have not been established. I do not wish to appear hypercritical and I would avoid the too common attitude of destructive criticism that frequently cloaks a limited understanding of the subject in hand, because I believe that anything which will add to the knowledge of the extent of liver damage would be of tremendous value. Nevertheless I think each departure should be carefully scrutinized to determine whether we are not going to a bit more trouble and not finding a great deal more than would be found by the simple test which shows bile in the blood serum.

Finally, the matter of liver insufficiency: I do not believe this would be substantiated by the physiologists. Individuals may die with considerable liver damage, but I believe that the animals and the men who die with liver damage may die *with* liver insufficiency but not *because* of liver insufficiency. Now I may be misconstruing Dr. Walters' statement, but for me in view of the tremendous reserve it is very difficult to conceive of a clinically demonstrable degree of hepatic insufficiency. After all, the greatest question that arises in my mind is whether dye excretion is not more a measure of liver damage than liver function. Time alone will determine its clinical value.

There is one thing to be said for it: it will give a more uniform value, and once the limits of error have been established, those men who have the opportunity of a large series that Dr. Walters has and the controls that he has, will be able to present something that will give a more exact idea of function.

Dr. A. C. Strachauer (Minneapolis): We are greatly indebted to Dr. Walters for his very practical and extremely valuable work in the preoperative preparation of jaundiced patients. That work has resulted in the saving of lives of patients and, I believe, in the prolonging of the lives of surgeons by lessening their load and burden in this particular field of surgery.

As to the test which he has presented, I am not going to indulge in a lot of wind-jamming and waste of your time because I personally have not had any experience with the test. However, I want to express my appreciation of the efforts that are being made in increasing our knowledge in this field. I have the rather conceited feeling that as a profession the surgeons have pretty well gone the limit as far as technical aspects of the surgery of obstructive jaundice are concerned, and it is only as the result of efforts of this sort that improvement is to be expected. I was especially pleased to have Dr. Walters emphasize the importance of complete, thorough surgery.

We have a very valuable test in every case of the liver function at the time of observation of the patient by the symptoms and the picture which he presents. Clinically we know the inadvisability of operating upon these cases when they are not in good condition. We are altogether too hasty in operating upon these patients. Our results would be infinitely improved if we would frequently postpone surgery and by proper management—the Walters preparation, the forcing of fluid by hypodermoclysis, even transfusion if necessary, the feeding of carbohydrates, gruels and that sort of thing, the application of hot compresses over the abdomen and particularly over the liver—tide the patient over until the extra hazard of surgery has been removed. The cases of carcinoma of the head of the pancreas and of the ampulla will not be injured by this waiting, and we will find that most of the rest of the cases can be operated upon under favorable circumstances.

Dr. Waltman Walters (Rochester): I am very glad inded to have Dr. Zierold discuss my paper. Dr. Zierold, as you know, is interested in this type of case, and he has done a great deal to advance our knowledge along this line by studying the amount of bile pigment in the blood stream in its relation to blood coagulation. I believe he is quite right about the Rowntree-Rosenthal method being a test of hepatic damage rather than hepatic function. It is a point which is well taken, and I should like to emphasize it, because after all it is the amount of damage which determines our judgment as to the surgical procedures that should be employed.

The test that Dr. Zierold mentioned, the van den Bergh test, is a splendid one for estimating the amount of bile pigment in the blood stream, which bears a proportionate relationship to the amount of retention of the tetrachlorphthalein when obstructive jaundice is present. There is, however, an exception to this rule in the group of cases in which there are degenerative changes in the liver without jaundice. For instance, the case of the doctor I mentioned: the amount of bile pigment in the blood serum was small. He did not have obstructive jaundice. His liver just wasn't making the bile, and the tetrachlorphthalein test stood out as of value because it showed a tetrachlorphthalein retention grade 4 (basis of 1 to 4) and a maximal degree of degeneration in the liver. In that group of cases in which there is hepatic damage, without obstructive jaundice, the tetrachlorphthalein test is, I believe, the most valuable.

After the obstruction has been removed from the common duct and the jaundice has subsided, the amount of bile pigment in the blood serum returns to normal within a period of three or four days, but the amount of dye retention in the blood, being proportionate to the amount of degeneration in the liver, continues to show such damage for periods varying from weeks to months. I have seen several patients with obstructive jaundice who have had stones removed from the common duct in whom the jaundice and serum bile pigment returned to normal in from two to three weeks, yet the Rowntree-Rosenthal phenoltetrachlorphthalein test showed that hepatic damage was still present. Dr. Rosenthal has shown, in his paper presented at the American Medical Association this spring, that the patient with a cirrhosis of the liver has retention of the dye in the blood stream proportionate to the cirrhosis present. It is true that all patients with obstructive jaundice also have a variable degree of cirrhosis. Here again the value of the tetrachlorphthalein test is shown.

The limits of normal variation of the amount of dye in the blood serum, I believe, are fairly accurately determined. Piersol and Bockus in their article in this week's Journal of the American Medical Association, Rosenthal in his article, and Snell and Greene in their work, have shown that the amount of tetrachlorphthalein in the blood serum at the end of one hour does not exceed 3 per cent in normal cases, and at the end of two hours the dye is

entirely out of the blood serum, so that we have a fairly accurate basis of comparison.

With regard to urea and the liver: Mann of the Mayo Foundation finds a diminution in blood urea after the removal of the entire liver in dogs. In other words, we have reason to believe that one of the functions of the liver is to utilize amino acids of the split protein, deaminizing them, and excreting the waste as urea in the urine. In fact, Rowntree and Hurwitz, several years ago, suggested this as one method of determining hepatic function. When there was an increase of hepatic damage they found an increase of amino acids and ammonia in the urine, and a decrease in urea, whereas the opposite should be true in cases in which the liver is working normally.

SAN-GRI-NA

"San-Gri-Na is the formula of a French physician. It has been used in Europe by millionaires, actresses and hundreds of fat men and women because it is simple, easy, pleasant and harmless." Thus runs part of the advertising claptrap for San-Gri-Na, one of the recent entrants to the "obesity cure" field. The preparation is put out by the "Scientific Research Laboratories," New York City. The newspaper advertisements convey to the obese public the idea that it is unnecessary to exercise or diet, the only desideratum being the purchase of San-Gri-Na. When the stuff has been bought, however, the purchaser finds that in addition to San-Gri-Na she should take the juice of one lemon in a glass of warm water every morning, chew her food very thoroughly, eat only two or three light meals a day, sleep not more than six or seven hours, do a reasonable amount of walking, take no liquid with meals, avoid starches, fat and candy. From the analysis of San-Gri-Na in the A. M. A. Chemical Laboratory, it appears that the product consists of tablets containing sulphur and cream of tartar with a small quantity of phenolphthalein as their essential constituents. *(Journal A. M. A., Nov. 22, 1924, p. 1703.)*

PAINODYNES

According to the label on the bottle, Painodynes, sold by the Wm. A. Webster Co., Memphis, Tenn., consists of "An organic compound containing Neurodyne 5 grains, Theine Citrated ½ grain combined with triple bromides ½ grain." The firm states that Neurodyne is "Ortho Hydroxybenzoic Acetic Acid Ester" and that the compound used is of the highest degree of purity. "Ortho Hydroxybenzoic Acetic Acid Ester" is a ridiculously long drawn out name for acetylsalicylic acid. Tests made in the A. M. A. Chemical Laboratory indicated the presence of this substance in Painodynes; the tests did not confirm the claim that the product used was of the highest purity. Furthermore, the Laboratory was unable to find any citrate, although "Theine citrated" is. These discrepancies are not surprising, as the firm has pleaded guilty a number of times to the charge of adulteration and misbranding. Painodynes belongs to the class of irrational shotgun mixtures marketed with unwarranted claims. *(Journal A. M. A., Nov. 22, 1924, p. 1705.)*

THE TREATMENT OF CONGENITAL CLEFT LIP AND PALATE

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The child that is born with a congenital defect is most frequently seen either at birth or a short time after by the attending family physician. It naturally follows that the family physician is the first individual called upon to offer advice concerning treatment. This throws upon his shoulders an exceedingly important responsibility. It is unfortunate for all concerned that world-renowned specialists in the treatment of these afflictions have not as yet come to an agreement regarding the standardization of the most efficient method for their management.

Perhaps the reason for this is not far to seek. It may probably be explained upon the basis that the results obtained by any method of treatment yet devised offer a fair measure of success in a percentage of cases far below one hundred. It is probably also true that in the hands of the expert the methods of treatment of which he is master give comparatively good results, whereas he may have found the methods of others less efficient in his hands. The comparative rarity of these conditions, combined with the willingness of those who have had no special training in their treatment to attempt their management, has resulted in an exceedingly high percentage of failures or partial failures. Furthermore, we must all realize that the successful management of cleft lip and palate cases is a difficult procedure.

To one of our own countrymen, Dr. Truman W. Brophy, should go the greatest credit for the early recognition and persistent reiteration of the fact that cleft lip and palate offer such extreme difficulty to their correction on account of the great underlying factor of bony diastasis which he considers of much more importance than the simple separation of the soft tissues. It is also through Brophy's teachings that we have learned that after overcoming the bony displacement the reestablishment of the soft parts becomes a much simplified procedure. It is unfortunate that the teachings of this master are so little understood and that therefore attempts at carrying out his methods have not infrequently been unsuccessful.

If one of Brophy's premises is correct—and this

is borne out by many observers, notably by Sir Edwin Keith of the Royal Museum of England—there is at birth but a slight loss of tissue in the upper jaws of the child who is afflicted with a complete cleft palate. Mr. Keith found, after the examination of numerous specimens, that the variation in the combined width of the tissues of the separated halves of the palate was uniformly within 3 millimeters of that of the normal. Soon after birth, however, through failure of continued

Fig. 1. Showing lateral deviation of the nose in an infant born with a unilateral cleft lip and palate.

normal development, the difference in width becomes more appreciable. Brophy observes furthermore that after thorough apposition and union of the cancellated bone of the opposing bony processes has been established the growth of the palatal structures progresses approximately normally.

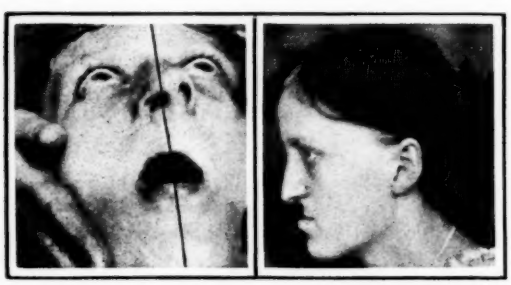

Fig. 2 Fig. 3

Fig. 2. Showing lateral deviation of the nose in a girl 16 years of age in whom the lip was closed 11 days after birth and in whom no reposition of the bones had been made. Note: This patient could place the tip of the index finger between the anterior borders of the alveolar processes. (See also Fig. 4.) The palate had not been closed.

Fig. 3. Profile view of patient shown in Fig. 2, showing the "thinning out" of the upper lip with the "fish-mouth" appearance due to causes mentioned in the text.

He also calls attention to the fact that the approximation of the anterior alveolar processes only will invariably result in a divergence of the *posterior* segments of the palate. In other words, any force which tends to approximate *only* the anterior borders of the alveolar processes, causes the superior maxillæ to rotate around a vertical line drawn through their center. It was these factors which induced him many years ago to advocate the early reposition of the separated halves of the maxillæ posteriorly as well as anteriorly. It was on these principles that he based his objections to the preliminary closing of the lip and, as well, to all means proposed for the purpose of bringing about the same result, i. e., the approximation of only the anterior borders of the alveolar processes.

It is a matter of common observation that every individual with a unilateral cleft presents a nasal deflection toward the side to which the premaxilla is attached (Fig. 1) and that the approximation of

Fig. 4. Showing bony diastasis of the alveolar processes in a boy of seven years, whose lip only had been closed in infancy. Note here that nasal deflection was also present.

the anterior borders of the alveolar processes only, no matter how it is accomplished, fails signally to completely overcome this deflection. This, to my mind, is the chief objection to depending upon early closure of the lip for the purpose of overcoming the alveolar diastasis. My case records show that over 50 per cent of the patients that I have been called upon to treat have been operated upon one or more times before coming to me. In every instance in which the lip alone had been closed in infancy, the patient presented nasal deflection (Fig. 2), a depression of the ala, absence of bony union between the alveolar processes and in many instances marked retraction of the upper lip giving the "fish mouth" appearance in profile

(Fig. 3). In a number of cases it was possible for the patient to place the distal phalanx of the first finger between the anterior borders of the separated alveolar processes (Fig. 4). In all cases the soft palate presented an extremely wide defect even though no attempt had been made at closure and

Fig. 5

Fig. 6

Fig. 5. Cleft palate and lip-tripartite type. Showing bony diastasis of the alveolar processes in conjunction with wide separation of the nasal alæ and protruding premaxilla. (See Fig. 6.)

Fig. 6. Showing a profile view of the tripartite type with inordinate protrusion of the premaxilla. (See Fig. 5.)

where such an attempt had been followed by failure the diastasis was even greater.

While there are many varieties of these defects, the principles underlying their treatment may perhaps be most clearly discussed by referring only to the two main classes: First (bipartite), those cases in which a single cleft extends through the lip and palate and which are always accompanied by a marked lateral deviation of the nose (Fig. 1); and, second (tripartite), those in which the cleft in

Fig. 7. Bipartite type showing the result of the Brophy wiring operation. Compare with Fig. 1. Note symmetry of face after bony reposition has been established.

the lip is double, the premaxilla being separated from the alveolar processes on both sides. In this latter class the premaxilla usually protrudes inordinately (Figs. 5 and 6). The nose is broad and depressed but is not deflected to either side.

In either instance the surgeon is confronted with the necessity for carrying out three distinct procedures, as follows: The establishment of a normal bony union bringing the separated portions of the superior maxillary bones into apposition (Figs. 7, 8 and 9), the union of the separated segments of the lip and the union of the structures of the soft palate.

Suggested method of procedure: Readjustment of the displaced bones. We are unqualifiedly in favor of the method advocated by Brophy for the early bony reconstruction of the upper jaw. The ease with which this procedure may be carried out will depend a great deal upon the age at which the child is admitted. Brophy puts the limit at about six months and it is well known that the operation is much simplified in the early weeks of life when the bony tissues are easily restored to their normal position. From three to six weeks of age would seem to be the ideal period in which to carry out this procedure. At any time, up to the age of six months, the separated bones may be forced together by compressing the upper jaws

Fig. 8

Fig. 9

Fig. 8. Tripartite type, showing the result of the Brophy wiring operation. Compare with Figs. 5 and 6. Note the resulting narrowing of the nose and the normal position of the premaxilla.

Fig. 9. Profile view of Fig. 8 after lip operation. Note the extreme thickness of the upper lip.

after freshening the borders of the alveolar processes and, in the tripartite type, the borders of the premaxilla as well. The parts may be held in normal position by means of silver wires and lead plates. The wires should be allowed to remain about eight weeks and even longer if in the interim failure of approximation takes place, under which circumstances the wires should be readjusted in order to insure the approximation. The causes of failure in attempting to carry out the Brophy technic have, in our observation, been due to three main factors. First. the failure to pass the wires

sufficiently *high* or in other words a sufficient distance *away* from the tissues of the palate; second, failure to pass the *posterior* wires sufficiently far *back;* and third, the attempt to move the bones into approximation by *twisting* the wires (in which case the latter are extremely likely to break) instead of

Fig. 10. Showing the position of the wires and lead plates in the Brophy operation. Note the method of overcoming the diastasis by making traction upon the wires and counter pressure upon the lead plates by means of the Kocher director.

bringing about the approximation by *external pressure* combined with *traction* upon the wires, which is facilitated by making pressure upon the lead plate with a Kocher's director, after which the wires are simply twisted upon each other to a degree which only "takes up the slack" (Fig. 10).

The age for this procedure, as stated above, is under six months and the desirable age from three to six or eight weeks. After bony union has taken place, the wires may be removed and the lip united. We usually remove the wires and unite the lip at one sitting.

The underlying principles of treatment of the tripartite type of cleft lip and palate differ but slightly from the single form. Here, while the lateral nasal deflection is absent, the protruding premaxilla and the depression of the nose offer problems the solution of which often tax the surgeon's ingenuity to the utmost. The great mistakes which have been apparent in the unsuccessful cases coming under our observation have been due mainly to failure to overcome the wide separation of the superior maxillæ during infancy and *especially* to the *removal* of the *protruding premaxilla.* Another mistake less grave, which one often sees, is the result of forcing the premaxilla too far posteriorly, a maneuver which also results in the "fish mouth" deformity. Where the premaxilla is allowed to remain and the lateral halves of the superior maxillæ are not brought closely enough together, this deformity is sure to result. We believe that the ideal procedure is to narrow the bony diastasis in early infancy, freshen the anterior surfaces of the premaxilla and at once reconstruct the bony arch of the upper jaw, holding the segments in place by means of silver wire and lead plates (Figs. 8 and 9). As Brophy states, this allows the normal development of the upper jaw and offers a most excellent opportunity for the later closure of the soft palate, which is always a most difficult procedure. Upon the removal of the wires and plates the upper lip may be repaired and if sufficient undermining is carried out the nasal depression may be overcome (Figs. 9, 11 and 12). Recently we have divided the lower end of the septum as an aid in elevating the nose, with gratifying results.

CLOSURE OF CLEFT LIP

Many ingenious methods have been devised for overcoming this deformity. We will refer but briefly to some of the fundamental points. The procedure of Owen is a most excellent one because of its two main essentials. First, it most effectually guards against the "notch," which is a not infrequent sequel to operation. Second, the carrying out of this procedure necessitates incisions more or less transversely across the lip. Such incisions

Fig. 11 Fig. 12

Fig. 11. Showing symmetry of nose immediately after closure of single cleft lip, eight weeks after Brophy wiring. Compare with Figs. 1 and 7.

Fig. 12. Showing symmetry of nose and normal thickness of lip some years after Brophy wiring and lip repair. Compare with Figs. 1 and 7.

reduce to a minimum the unsightliness of a resulting scar. The objectives to be aimed at are symmetrically shaped nostrils (Figs. 11 and 12) (and here it should be remembered that the size and

shape of the nose of an individual is of much less importance than is its symmetry), and, second, a lip of generous length and thickness. The length of the lip may be made entirely dependent upon the amount of "undercutting" and the carrying of incisions around the nasal alæ. Thickness may be increased by dividing the lip on a slant while freshening the borders or by a method which we have been attempting to perfect for a number of years.

In all work upon cleft lip, the late results should be anticipated and considered more important than the actual cosmetic result obtained at the time of operation. It should be remembered that it is a comparatively simple matter to remove a small amount of redundant tissue later and that secondary undercutting must necessarily deal with scar tissue with its attendant difficulties.

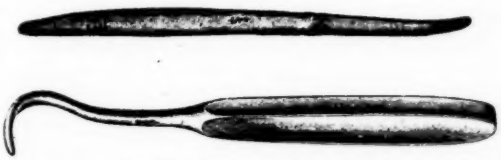

Fig. 13. Showing elevators used in freeing muco-periosteum preliminary to closure of cleft palate.

CLOSURE OF THE SOFT PALATE

Provided a case has received the proper early management, the closure of the soft palate is not necessarily extremely difficult. The ideal time is perhaps between the fourteenth and eighteenth month, when the child has not yet begun to talk, but has gained strength and vigor and when the mouth has increased in caliber. The technical factors which make for success in this part of the procedure are a good exposure, an extremely gentle technic, avoidance of lateral incisions, adaptable instruments and appropriate suture material, which should be placed at the proper tension. In addition to the usual instruments we have found the elevators (Fig. 13) exceedingly useful. Wide freeing of the muco-periosteum is essential, as is the conservation of the blood and nerve supply. We have never found lateral incisions necessary in cases which have not been neglected or previously operated upon. Horsehair is the suture material of choice and we have found preliminary massive infiltration with weak novocain solutions an aid in raising the flaps.

Time will not permit a discussion of the importance of having every patient in the best possible physical condition for operation nor the great part which the after-treatment plays in bringing about success.

To summarize: We believe that the most important procedure in complete cleft lip and palate is the *early restoration* of the *bony maxillary arch;* that the ideal time for making this restoration is between the third and the eighth week, and that it should always be done before the child is six months old; that the cleft lip should be operated upon before the child begins to talk, or between the fourteenth and eighteenth months; that when these procedures are carried out in consonance with the principles herein enumerated, the results of treatment will be greatly improved and that operations upon the neglected cases and those which have resulted in partial failure will less frequently be found necessary; and, finally, that the extreme importance of the parents of these unfortunate children receiving proper advice from their family physicians cannot be overemphasized.

HOYT'S GLUTEN FLAKES NOT ACCEPTED FOR N. N. R.

Hoyt's Gluten Flakes is marketed by the Pure Gluten Food Co., New York, as a ready-to-eat gluten preparation. The claims are made that it is "a perfect gluten," that it contains "40 per cent protein," which is asserted to be the government standard for gluten, and that it is "free from starch." These statements of composition are misleading. A product containing 40 per cent of protein is not a "perfect gluten" nor is 40 per cent the government standard for gluten flour, but the lowest limit of protein to which the term gluten flour may be applied without incurring danger of prosecution by the federal authorities. The Council on Pharmacy and Chemistry declared Hoyt's Gluten Flakes inadmissible to New and Non-official Remedies because (1) its composition is not correctly declared and (2) the claims for its effects on nutrition and health are unwarranted and misleading. (*Jour. A. M. A., Jan. 3, 1925, p. 53.*)

CALCREOSE WITH IODIN

The Council on Pharmacy and Chemistry reports that Tablets Calcreose with Iodin are unacceptable for New and Non-official Remedies because the composition of the product is unscientific, and its use is, therefore, inimical to the interests of the public and the medical profession. The Maltbie Chemical Co., which markets the tablets, claims that each tablet contains calcreose 4 grains, and iodin 1/30 grain. The use of the tablets by the physician would mean that the patient in addition to the required dose of iodin would also have to take the creosote compound, calcreose. The creosote compound might be superfluous or contraindicated. (*Jour. A. M. A., Jan. 31, 1925, p. 388.*)

NEWER IDEAS OF INFECTION IN NERVOUS DISEASE*

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In preparing to present the newer conception of the rôle of infection in nervous disease one finds an unlimited field. The subject is so broad and its scope so vast that a detailed discussion in a short time is impossible. It is the object of this paper to review and to emphasize the recent advances in this very important branch of medicine and to point out in a general way their practical value. It shall cover not merely focal infection in its different forms but infective processes in general, including acute and chronic infectious diseases, with their consequent good or bad effect upon the nervous system. And it must necessarily embrace both organic and functional nervous diseases as well as disorders of mentality.

In order to appreciate fully the pathological processes involved, there are two factors of great importance to be considered: first, the fact that the tissues of the nervous system respond to infective processes just as any other tissues of the body do; second, the fact that there are various pathways whereby infection enters the nervous system.

With reference to the first factor, it may be said that the central and peripheral nervous systems are subject to inflammation, accompanied by congestion, infiltration and edema, resulting often in degeneration with disintegration of function, as are all the other vital organs. This process may be acute and rapid or chronic and slowly progressive. It may be due to direct bacterial invasion, as in cerebro-spinal meningitis, or to the toxins liberated by bacteria elsewhere in the body, as in tetanus, or it may be caused by non-bacterial agents such as drugs and alcohol. The degree of involvement of the nervous system does not depend necessarily upon the location or size of the exciting focus. Illustrative of this fact is a case recently seen in consultation with Dr. E. H. Norris of St. Paul. The patient, a mail-carrier, received a prick in the heel of one foot from a nail in his shoe. There developed a small circumscribed area about the size of a split pea, and yet when first seen this man had a tetanic contraction of practically every muscle in his body—including even the spinal group.

The pathway by which infection most frequently enters the central nervous system is by way of the air passages. Under normal conditions these are guarded by the cilia of the mucosa and by the mucoid material with which the mucosa is bathed. In bacteria carriers it is found that the organisms as a rule are embedded in a mass of mucus, and in such cases the carriers themselves do not seem to develop an immunity to the organism carried. This fact is evidence that there has been no systemic effect of the presence of these organisms. It is logical to suppose that any condition arising to cut down the normal amount of mucus secreted or to interfere with the proper functioning of the cilia, predisposes to infection of the central nervous system by rendering less effective these sentries of the airways. A break in continuity of the mucosa itself completes the route for invasion. The common infections entering in this way are poliomyelitis, meningitis of all kinds and epidemic encephalitis. In the latter, though the causative factor is as yet unknown, we feel justified in the assumption that it is a respiratory infection because of the fact that the greater percentage of cases are preceded by some acute pathologic process in the nose or throat.

In addition to the respiratory tract, the blood and lymph channels are highways of infection for the nervous system. Not only do they function as such after a break in the respiratory mucosa occurs, thereby allowing infection to enter, but they are pathways for infection from sources in outlying parts of the body. For instance, in tetanus the intoxication takes place through both blood and lymph channels and can be demonstrated experimentally in the blood, even in its earliest stages. Marie, Meyer and Ransome have shown that the toxins of tetanus are carried from the initial lesion to the blood by the lymphatic system, then by the blood to the motor end plates and finally by the efferent nerves to the spinal cord. The nerve sheaths are the actual transmitters of the toxins, and in experiments, if the efferent nerves are cut, fatal dosage of tetanus may be given with no cord involvement at all.

Foster Kennedy, in a recent article, draws attention to the fact that trismus, through irritation of the motor root of the fifth nerve, is one of the

*Presented before the annual meeting of the Minnesota State Medical Association, St. Cloud, Minn., October 10, 1924.

earliest symptoms of a generalized tetanus, even when the infection is in the lower extremities; that in post-diphtheritic intoxication, oculomotor paralysis is a fairly constant feature, no matter where the infecting focus is, and that early in epidemic encephalitis we find the third nerve nuclei infected. He regards these phenomena as evidences of blood-borne infection, and suggests that their occurrence may be due, not alone to the special delicacy of their structure, but to "pathways of invasion not yet understood."

Added to these avenues of entrance to the nervous system is a fourth—that of direct extension from the mastoid, the middle ear or the sinuses of the skull. This is demonstrated by the occurrence of brain abscesses or infections secondary to otitis media or mastoid or sinus disease.

Having established the fact that the nervous system is subject to infection, and having pointed out the paths whereby the toxins enter, let us now consider what the effects of infection upon the nervous system are and of what value it is to us to understand them.

First, *focal infection.* For the past few years the medical profession has been demonstrating its interest in this field. The pendulum has swung from conservatism to radicalism and now in its inevitable way is swinging back again. There have been enthusiasts who advocated the indiscriminate pulling of teeth—and so we see young men and women of twenty-five or thirty wearing one or more plates. Others have insisted that the tonsils must be the root of all evil and have advised the removal of these organs "ad libitum." Pages might be written on this, but time does not permit. We have all seen startling recoveries from neuritis, from functional nervous disorders and from psychoses following the extirpation of focal infection. The writer has recently seen three cases of violent insanity clear up almost miraculously, two following the extraction of badly abscessed teeth and one following the removal of diseased tonsils. He has also recently seen a mental case clear up following treatment of a severe Vincent's angina. The ordinary toxic psychosis resulting from Copenhagen snuff is promptly relieved when the snuff is withdrawn. On the other hand, we see many cases of neuritis where we cannot find a focus of infection and where abscessed teeth, infected sinuses or diseased tonsils do not exist. Also there are many cases of insanity where the removal of concrete foci of infection has no apparent effect upon the mental condition.

In the *American Journal of Psychiatry* for October, 1923, is a very comprehensive study of focal infection in mental disease by Kopeloff and Kirby. In a series of 120 cases under their observation, they reach the conclusion that the removal of foci of infection did no good and that focal infection is not the etiological factor in functional psychoses.

Cotton believes that the presence of bacteria in the gastric contents is evidence of focal infection and a cause of mental disease. Still others* assert that all cases of dementia precox and manic depressive insanity are due to intestinal infection and that the symptoms of mental disease will all disappear following the proper treatment of this intestinal condition, but they tactfully admit that they do not know just what "this proper treatment should be."

We cannot agree with any of the above. Definite relief of neuralgia and neuritis does occur often following removal of diseased teeth and tonsils or following the cleaning up of infected sinuses. Also serious neurological disease may follow gastro-intestinal infection.

The writer has under his care at present a young man with a multiple neuritis involving all extremities. There is pronounced nerve trunk tenderness, extensive atrophy of all muscles in both upper and lower limbs, with some foot-drop and great weakness. This condition came on secondary to a severe gastro-enteritis which followed the eating of a piece of blueberry pie made of canned blueberries. Other members of the family suffered the gastro-intestinal disorder, with pain, nausea, vomiting and diarrhea, but the patient is the only one in whom a neuritis developed. We believe that there is a rational "middle ground" on which to take our stand in this matter. Focal infection is most assuredly a contributing factor in the causation of nervous disease. One of the great advances in neuro-psychiatry in the last few years is the recognition of the fact that chronic infection plays an important part in the so-called "functional neuroses." These are the patients who wander from one doctor to another, complaining vaguely of indefinite pain and queer sensations, of "blue spells" and insomnia and of lassitude and discontent. Little sympathy and less attention is what they usually receive.

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*C. B. King (Chicago), Illinois Medical Journal, February, 1922.

It is our custom to examine routinely the nose, throat, teeth, sinuses and tonsils of all patients who come to us. If abscessed teeth are found, if diseased tonsils, infected sinuses or deficient air passages are discovered, we believe the condition found should be corrected. Pus pockets anywhere are detrimental to good health in general. We do not attribute to these alone the cause of all nervous disorders, but we believe they are contributing factors which should be removed as a matter of hygiene and for the best interest of the patient, whether his disease be functional or organic.

One would like to discuss infection in its relation to chorea, a disease so common, in which the removal of all foci is of the utmost importance; also in regard to epilepsy, special stress being laid on its occurrence secondary to influenza and encephalitis; and to myelitis, which follows acute infections far more frequently than is commonly supposed. Only a month ago a case was seen in consultation with Dr. G. K. Hagaman of St. Paul, of complete transverse myelitis in the lower dorsal region in a child six years old recovering from tetanus.

Time and space do not permit detailed discussion of these, but we cannot pass on without a word concerning influenza, that terrible scourge which left its indelible mark upon the nervous systems of many of those who suffered from it. Never in the history of medicine has there been an acute infectious febrile disease which perpetuated itself in such a great variety of sequelæ. From the mild neuroses to the lethal encephalitis, from peripheral neuritis to epilepsy and insanity, we are even yet meeting the "hang-overs" of this dread disease.

Of the chronic neurological diseases, perhaps the one best suited to discuss in relation to infection is multiple or disseminated sclerosis. Occurring with startling frequency, almost always in young individuals, insidious in its onset and deadly in its progress, it presents a very interesting problem as to cause. For the past two or three years the treatment of this disease with neo-salvarsan, mercury and the iodides—and occasionally with spinal drainage—has given the most gratifying results. Remissions are obtained repeatedly by this method in cases which have responded to no other medication. Since it responds so readily to the same treatment which is used in cerebro-spinal lues, may we not assume that this disease is caused by an organism which is a member of the spirochete family? Marinesco has demonstrated the presence of motile spirochetes in his experiments with multiple sclerosis in guinea pigs. These were of unequal size and not of the same nature as the treponema pallida of syphilis. Marie, in 1887, was the first to maintain the infectious origin of multiple sclerosis. Since that time, numerous experimenters have investigated it and some have been willing to express the opinion that it is due to a specific organism; but in spite of all this work no definite conclusion as to the causation has been reached. No one as yet has been able to demonstrate such a causative agent, but the results seem to justify the assumption that such is the case.

One of the most interesting experiments in nervous disease is the one now being conducted in various places relative to the treatment of general paresis by malarial infection. The literature of the past year contains several reports of this treatment. Its principle depends upon the fact that remissions in chronic diseases may occur following the attack of an acute specific fever. The technique, as described by Templeton,* is as follows: Take from two to four c.c. of blood from the vein of a patient suffering from benign tertian malaria—whether the stage be febrile or not—and inject it subcutaneously into the paretic patient. Within a week typical malarial attacks will develop. These are allowed to run until ten or twelve have occurred, when the malaria is cured by giving quinine in the usual manner. Following the febrile stage, and at the same time the quinine is being given, neo-salvarsan is used intravenously once a week in the usual dosage. This is continued as long as is necessary to produce the desired result.

A peculiar fact noted by observers of this treatment is that during the malarial attacks there is often an acute exacerbation of mental symptoms, consisting chiefly of auditory hallucinations and delusions of persecution. In most cases it has been found that these subside promptly when the febrile stage is over. We, who believe in spinal drainage and in the use of salvarsanized serum in the subarachnoid space according to the Swift-Ellis method, would be inclined to follow that method of treatment after the malarial onslaught. Also we believe it would be of advantage to use the serum by intra-cisternal injection, thus bringing a more direct attack upon the diseased area.

*Brit. Med. Jour., May 26, 1923, p. 895.

That malaria in itself is not a specific for syphilis is a rational belief and though the mental symptoms of paresis may clear up phenomenally after the febrile attacks it is not necessarily a fact that there are changes in the spinal fluid findings as a result of the malarial infections alone. One author reports that the spinal fluid has returned to normal after the malarial attack but the majority find no change. Therefore we must continue to use our specific treatment until we get serological normalcy or as near it as possible. Thus we see that our acute infection is not a cure but an adjunct. Just what part it plays is a mystery. Its action may be purely to quicken the metabolic processes; to consume some of the toxic and inflammatory products in the affected brain cells with its pyrexial fire, or there may be a biological relationship existing between the spirocheta pallida and the plasmodium malariæ. Suffice to say that reports of this method of treatment show a higher percentage of remissions than that obtained by any other form of therapy. But in our optimism we must not lose sight of the fact that general paresis is parenchymatous syphilis of the brain; that its pathology is a progressive degeneration of brain structure and that degenerated tissue cannot be restored. Therefore in the malarial treatment as in all other forms, early diagnosis and early therapy are imperative for success.

A curious comment upon this subject is made by Nathaniel Bercovitz of Hainan, China, in a communication published in a recent issue of the *Journal* of the American Medical Association. He observes after an experience of eight years in this territory that while general syphilis is very prevalent, neurosyphilis is rarely seen. He states also that malaria is almost a universal disease among those people and that probably all of the inhabitants harbor the parasites in their systems. He suggests that the rarity of neurosyphilis in this prevalence of general syphilis may be due to the inhibiting influence of the malarial plasmodiæ. Is it possible then that we may look forward to a time when we can treat general syphilitics with malaria in the hope of preventing neurosyphilis? Ley, of Belgium, actually reports cures in 40 per cent of cases treated by the malaria method, followed by neo-salvarsan. This is a bold statement, for never yet has paresis been regarded as curable. Remission, with a clearing up of clinical symptoms for an indefinite period, has been the greatest reward of persistent treatment. Ley's report is enlightening, and if it is the forerunner of greater progress, there is offered indeed a new hope to these condemned individuals.

Startling effects of other acute febrile infections upon disease of the nervous system are not uncommonly witnessed. This is true particularly in mental disorders. Four years ago a young man was sent to us from North Dakota, suffering from the paranoid form of dementia precox. He was a violent case, having to be kept in full restraint all the time. He made little or no progress mentally for several weeks. At the end of that time he became acutely ill with a lobar pneumonia involving both lungs. The severity of the infection can be realized by the fact that his temperature per rectum registered 112°F. Three different thermometers were used to verify this. The pneumonia terminated by crisis about the eighth day and synchronously with this came a clearing up of the mental condition. There was no return of the psychosis and when he had convalesced from the pneumonia he went home well and, as far as we know, has remained so. We cannot explain the phenomenon of a rectal temperature of 112°F., nor have we ever reported it before.

Erysipelas is a well-known infective backfire. Some eighteen months ago the writer observed for several weeks a man suffering from what was thought to be lethargic encephalitis. He was picked up on a street unconscious, was brought to the hospital and for some weeks apparently lingered between life and death, irrational, at times comatose, febrile and in every way very sick. He suddenly developed a facial erysipelas, which ran a very severe course for about ten days. As this acute infection subsided his mentality cleared, he became rational and made a perfect recovery.

These two instances serve to illustrate the beneficial effect of acute infectious processes upon brain disorders. For years there have been attempts made to establish some standard treatments involving this principle, but with no great results. Tuberculin in paresis has been faithfully tried in the hope of quickening the metabolic rate and affecting a cure. Intramuscular injections of turpentine have been used in other chronic nervous disorders, in the hope that an artificial leucocytosis so created might be of benefit, but both have been discarded.

In conclusion, the salient points which we can pick from our review of this subject are:

1. The nervous system is subject to infection like all other tissues of the body.

2. There are four main pathways of infection in the nervous system—i. e., air passages, blood, lymphatics and direct extension.

3. Infection of any kind is an important contributory cause of organic and functional nervous disease, but is not the sole etiologic factor.

4. Certain acute specific febrile infections have a curative effect upon mental disorders, but so far this has no scientific basis.

5. The use of tertian malaria in the treatment of general paresis appears to give an increased percentage of remissions.

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DISCUSSION

Dr. H. W. Woltman (Rochester): Dr. Hengstler's survey of this large field of more or less serious diseases, calls our attention to an earnest effort that is being made to break away from some of the traditional doctrines concerning the cause and treatment of nervous diseases, and to develop more hopeful and rational methods of therapy.

The infectious nature of such conditions as brain abscess, tetanus and syphilis is no longer questioned, but not so the causation by micro-organisms of other illnesses such as multiple sclerosis, chronic anterior poliomyelitis and transient cranial nerve palsies.

There was a time when every dropped lid and crossed eye spelled syphilis and when potassium iodid was the sheet anchor of therapy. This convenient practice is disappearing.

There is good clinical evidence for presuming that infection may be responsible for most of the diseases mentioned by Dr. Hengstler. In Bell's palsy, for example, there is often a history of an associated cold. In one case of recurrent sixth nerve paralysis and in another of a recurrent bulbar palsy syndrome that we had opportunity of observing the concomitantly recurring attacks of arthritis gave striking evidence of infection.

The laboratory gives additional support to this view. Fibrillary tremors, as seen in chronic polio, hiccoughing and respiratory syndromes, as seen in encephalitis, etc., are astonishing occurrences when observed in animals, yet Dr. Rosenow has reproduced these experimentally by the injection of organisms obtained from patients who exhibited corresponding phenomena.

Any measure such as the removal of foci and the administration of a vaccine that offers a possibility of arresting the progress of such sinister and fatal diseases as chronic poliomyelitis and multiple sclerosis, deserves a fair trial in selected cases.

A correct diagnosis is essential. The removal of infected foci, for example, cannot be condemned, as is often the case when it fails to banish brain tumors, trifacial neuralgia, migraine or the psychoneuroses.

The discovery of spirochetes in the diseased areas of multiple sclerosis, a finding not yet wholly confirmed, led to much speculation regarding the therapeutic efficacy of arsenical preparations. Recently we had the opportunity of making a careful search by dark field illumination of fresh material from a case of multiple sclerosis, but we were unable to find the spirochetes described by Kuhn and Steiner.

We have tried non-specific arsphenamin therapy and tryparsamid in cases of multiple sclerosis, but with uncertain results. In a few instances there was striking improvement after its use, but in these cases foci had been removed as well. It is obvious, however, that the response is in no way comparable to that observed in neurosyphilis.

Dr. Hengstler's paper is an excellent pithy and practical presentation of a very important subject, a problem that concerns all of us.

Dr. A. S. Hamilton (Minneapolis). Mr. Chairman, I do not think Dr. Hengstler could have chosen a more opportune subject than that which he has presented today. There are some very enthusiastic advocates for the influence of infections in nervous and mental diseases today. For instance, we have the dentists always with us, and some have very advanced ideas on this subject. Very recently, a dental friend of mine berated me severely because I refused to sanction the extraction of teeth in his poor old grandmother who was in a state of senile dementia.

Then we have the group represented by members in our own profession who go cheerfully on from year to year adding to their statistics in mental cases and claiming more and more for intervention by way of extraction of the teeth and tonsils, the gall bladder and large intestines, and invading the female pelvis at times and claiming to have some wonderful results. Their percentage of cures has been advanced from time to time, until now they claim something like 80 or 85 per cent of cures in the cases submitted to their care. Once, they were deterred by the problems offered by senile dementia and apoplexy and advanced mental deterioration, but even these cases are now claimed to be materially benefited.

Now, beside this possible general result of infection, we have also that specific physical effect: that is, a definite nervous condition due to direct effect upon some one par-

ticular part of the nervous system. Years ago, we used to think of poliomyelitis as a sort of thief that stole in in the night and left only a focal paralysis, with no constitutional symptoms, that neither got worse nor better. Then I remember when poliomyelitis broke out in epidemic form in Barnum and Moose Lake and we found a condition which comes on with prodromes, high fever, rapid pulse, and even such phenomena as marked convulsions and death.

Since then, we have suffered from a rather extraordinary series of infections of the nervous system. First, it was in the cord, and then it rose a little higher up and was called polioencephalitis inferior, then it was called polioencephalitis superior, and when we couldn't group all the cases under these heads, we had to use the terms sub-acute anterior poliomyelitis and chronic anterior poliomyelitis. And then, we had progressive muscular atrophy, of course, and later we developed a peculiar series of cases of multiple neuritis and myelitis, and finally we developed the present conception of encephalitis, which, at first, had a clear group of symptoms and was known as sleeping sickness on account of one of its very prominent features, but which is now manifested by almost any neurologic phenomena. In fact, we have now reached the stage that when one meets a group of symptoms involving the idea of organic changes in the brain and which we cannot otherwise associate, we are very likely to use the term encephalitis and the situation is rather bewildering. How all these conditions to which I have referred are associated with each other, I am not prepared to say, but I have never gotten over the feeling that they are associated and that, in a sense, we have progressed from one to the other. It is certain that all our recent epidemics of infections of the nervous system have shown different pictures in different localities and even at different times in the same locality.

Ordinarily, we think of infection of the nervous system as a pernicious influence but Dr. Hengstler has spoken of its possible benign effect, as, for instance, in induced malaria and in intercurrent pneumonia and erysipelas. That malaria may greatly alleviate so deeply founded a parenchymatous syphilitic conditions as paresis, seems like an extravagant and foolish statement; yet there is abundant evidence to show that, somehow or other, infections with marked constitutional reactions may have wonderful effects upon both mental and nervous conditions. The literature on mental disease for many years past contains reference to cases where a patient has gotten well following injuries with severe pus infection and following pneumonia, typhoid, etc. Some years ago, I saw an epidemic of typhoid fever develop in a hospital for the insane. There were 286 cases of typhoid, and when one recalls that in a state hospital there are gathered a large number of patients with very bad behavior and with many maniacal conditions, I think you will agree that 286 such individuals with typhoid fever would constitute a real problem in nursing. On the contrary, I assure you that in my experience as interne in a general hospital where we had many cases of typhoid, I never saw as well behaved a group of people with typhoid fever as I saw in that state hospital for the insane and, in this latter group, many showed mental improvement which, in its rapidity of development and in its completeness, was almost miraculous.

Among the 286 cases, were 28 epileptics. All these latter were cases with mental deterioration and mostly having fits at very frequent intervals. Out of the entire series of epileptics, only two patients had one fit each during the entire period of the acute illness, though several would have averaged as much as two or three per day under ordinary conditions. Unfortunately, as soon as the symptoms of acute infection had disappeared, the epileptics, without exception, returned to their fits, and the insane mostly, but not invariably, returned to their former state of insanity. Nevertheless, I have never ceased to feel that in such conditions as typhoid fever we have a tremendous power in influencing diseases, if only we could control it.

GOITER PREVENTION

Persons affected with thyroid disturbances have been aroused to the possibilities of relief that modern medicine offers. The public has been awakened to the problems that confront many of our communities, and the medical profession has been stirred to a realization of its duties to the public in demanding the institution of safe relief measures. The enthusiasm for relief measures must not be allowed to initiate the public into unwise or unwarranted practices. The fundamental concern of the health official is the prevention of endemic thyroid enlargement. In line with this the Cincinnati Board of Health proposes to confine its work to prevention and will refer children known to have thyroid enlargement to their family physician. Iodized table salt should not be regarded as a "cure-all." It will probably not cure a simple goiter, and the primary purpose of the preparation is to aid in providing the iodin that is essential to the proper functioning of the thyroid gland in normal persons, who compose the majority of the population. The exceedingly small quantity of iodin made available in this way must be skillfully supplemented by physicians when definite thyroid enlargement exists. *(Journal A. M. A., Dec. 6, 1924, p. 1849.)*

BETO

Beto is advertised as a "Blessing to Diabetics." Like most nostrums sold for the alleged cure of diabetes, Beto is featured as a product whose use makes it unnecessary for the diabetic to diet. When first put on the market, Beto was sold and advertised exclusively as a cure for diabetes. Later, it was recommended, in addition, for high blood pressure, "all kidney troubles" and dropsy. Beto comes in the form of tablets and sells at $5.00 per package. The A. M. A. Chemical Laboratory reports that the product may be considered to be composed of talc, 3 per cent, magnesium sulphate U. S. P., 97 per cent, and oil of cinnamon, a trace. Each tablet was equivalent to approximately 7 gm. of Epsom salt, or one-half the dose given in the U. S. Pharmacopoeia. Thus the purchaser of Beto pays $5.00 for 1½ pounds of Epsom salt, which can be bought for 15 cents a pound. Beto is not a cure for diabetes and to sell Epsom salt under the claim that it is a cure and with the deadly dangerous advice that when taking it, it is unnecessary for the diabetic to diet, is an offense against business morals and a menace to the public health. *(Jour. A. M. A., Jan. 24, 1925, p. 304.)*

SURGICAL ACCIDENTS IN SIMPLE INGUINAL HERNIOPLASTY*

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Because of modern surgical technic and asepsis, the surgical operation for the radical cure of uncomplicated simple inguinal hernia is frequently viewed lightly by the general surgeon. Indeed, the busy surgeon-in-chief, of almost any large charity hospital, regards this operation, from a technical standpoint, much as a certain wit regarded the Russian language. In discussing the intricacies of this unusual foreign tongue, he said, "The Russian is such an easy language—even the children speak it—over there." In like manner the surgeon disdainfully assigns the task of the operation for inguinal hernia to the house surgeon or surgical interne. And this, not ungrateful, but surgically hungry and eager-to-operate individual, who faithfully believes himself to have been born with a scalpel in his hand, not too grudgingly accepts it as though the procedure were but a toy on which he might cut his surgical wisdom tooth.

Fortunately the technic of the operation has become so conventional and standardized as to have proven itself one of the safest as well as one of the most successful of surgical methods. The patient himself does not fear it, and indeed has learned to ask for it whenever required. Yet simple as it may seem, the operation is not without danger, even though the mortality is exceedingly low. The accidental injury of nerves, large blood vessels, the spermatic cord, hernial sac contents and urinary bladder, has caused irreparable harm and wrecked not a few lives.

This point was again forcibly impressed on me recently by the announcement of a threatened litigation, in which a well-known and prominent surgeon was about to be sued because of a complete atrophy of the testicle following operation in a case of simple inguinal hernia. This it was, that influenced me, in bringing before you today, this rather elementary subject.

The literature abounds with numerous and varied discussions of the choice of methods of operation for the cure of inguinal hernia. Modifications of the old and developments of the new are of frequent occurrence. Indications and contraindications are emphasized. Mistakes and accidents, however, are rarely if ever mentioned. Indeed, the scarcity of detailed information, in medical literature, on this particular phase would tend to indicate that not much attention had been given to this important aspect of inguinal hernioplasty. Surgical accidents are chiefly the results of ignorance, carelessness, errors of judgment or defective technic. Because of the inherent human frailty which prevents mentioning and discussing, not to speak of publishing, our failures, accidents and mistakes, I have been unable to collect or review any series of cases.

Injury of the Nerves.—Among the most frequent, but fortunately less serious, accidents of inguinal hernioplasty, is injury of the nerves. These include the ilio-hypogastric, ilio-inguinal, and the genito-crural, and are mainly of the sensory type. Their main trunks are sufficiently large to be plainly seen and recognized. The ilio-hypogastric, the largest of the three, lies between the transversalis and the internal oblique muscles, above the crest of the ilium. About 2.5 to 3 cm. in front of the anterior superior spine, it penetrates the internal oblique muscle, running downward, under the aponeurosis of the external oblique, and pierces the latter, at about 1 inch above the external abdominal ring. The ilio-inguinal nerve also lies beneath the external oblique aponeurosis, but just above Poupart's ligament, and follows the course of the ilio-hypogastric, except that it accompanies the spermatic cord or round ligament, and emerges at the external abdominal ring. The genital branch of the genito-crural nerve enters the inguinal canal at the internal abdominal ring, traversing the canal, in company with the spermatic cord or round ligament, and emerges with it from the external ring. According to Cushing,[1] the ilio-hypogastric nerve may be twice encountered in the operation: the superficial supply, by the skin incision; and its deeper trunk, as it lies upon the muscle-fibres of the internal oblique at a varying distance from the lower edge of the muscle, by the incision which divides this muscle. In the inguinal canal, the ilio-inguinal and the genital branch of the genito-crural nerves are usually found anastomosed in one trunk. A division of the ilio-hypogastric nerve, he believes, causes an area of cutaneous anesthesia, surrounding the lower angle of the incision, and extending from a level about 7 centimeters above

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the root of the penis, within 1 or 2 centimeters of that organ. A division, on the other hand, of the ilio-inguinal and genito-crural nerves is represented by the usual anesthetic sequel of complete loss of sensation of the entire scrotal contents, cord, hernial sac, and testicle, with the possible exception of the lower vascular supply (superficial perineal), and by a cutaneous area of anesthesia, which occupies the inner side of Scarpa's triangle, over the abductor tendon. Division of the ilio-inguinal nerve is unassociated with any surface anesthesia of the scrotum whatever. Furthermore, his observations have been that a division of the ilio-inguinal and genito-crural nerves causes the cremasteric reflex to be lost, temporarily at least, on the side of the division. Therefore, particular care should be taken to avoid cutting, tearing, pinching, or bruising of these nerves. Division results in a complete anesthesia of the supplied area, from a few months up to two and one-half years. Inclusion of the nerves in the suture produces a persistent and annoying neuralgia, which may even require a dissection of the scar and freeing of the nerve before relief is obtained. As a result of many animal experiments, Moschowitz[2] has found that a complete division of the ilio-hypogastric nerve will be followed by a temporary anesthesia of the hypogastric region, that the inclusion of the nerve in the suture is likely to be followed by neuralgic pain, and also that a division of this nerve is not followed by local paralysis of the internal oblique muscle, contrary to the experiments of Dowd.[3] The latter believes the ilio-hypogastric nerve, in a small proportion of cases, which are likely to have recurrences, acts as a security against a relapse of the hernia, depending in a large measure on the vitality of the part to which this nerve goes. In order to escape injuring it, he believes that the first opening in the aponeurosis of the external oblique muscle be made by a knife-cut one and one-half inch above and external to the external ring, then a curved scissors is slipped through this opening, and the nerve and muscle are pushed well back before proceeding with the incision. Mackechnie[4] believes pain to be the most frequent complaint following inguinal hernioplasty, and in his opinion is due to the envelopment of the ilio-inguinal nerve in the scar tissues. Burrows[5] believes injury to the ilio-inguinal nerve may cause a persistently tender scar. In one case he found it necessary to excise such scar tissue. Authorities all agree that a division of these nerves is followed by an area of anesthesia, while their inclusion in the suture is a definite cause of neuralgic pain in this region as well as a tender scar.

Injury of the Blood Vessels.—An accurate knowledge of the course of the blood vessels of the inguinal region is essential for the successful hernia operation. Thus we are mainly concerned with the deep epigastric and the external iliac vessels. The former arise from the iliac artery and vein, behind Poupart's ligament, and according to Marcy[6] pass upward and inward close to the inner and under side of the cord, between it and the symphysis pubis. Here is given off a branch to the cord. For nearly two inches of its course the artery lies posterior to all the abdominal muscles beneath the peritoneum. It ascends obliquely and upward to the margin of the sheath of the rectus muscle. In its course, it lies behind the inguinal canal, to the inner side of the internal abdominal ring and immediately above the femoral ring. The position of the artery concerned in the hernia operation is, in the beginning of its course, close to the inner and under side of the spermatic cord where the latter issues from the internal ring. Here the artery is generally three inches from the symphysis pubis, and is at the same distance from the spine of the ilium. The artery is accompanied by veins, the largest of which is consistently found on the inner side of it. They end by a single trunk in the iliac vein. The external iliac artery is of far more importance in the surgical anatomy of inguinal hernia. This artery extends from the bifurcation of the common iliac, opposite the sacro-iliac articulation, to a point beneath Poupart's ligament between the anterior superior spine of the ilium and the symphysis pubis. It is accompanied throughout its course by the external iliac vein, which lies in a slightly posterior plane. Wounding of this artery is a catastrophe, and is usually brought about by an accidental needle puncture, when, in the suturing of the conjoined tendon to Poupart's ligament, the needle is passed too deeply. Coley[7] says he knows from personal conversation of four instances of injury to these vessels from needle puncture. O'Connor[8] refers to two instances in which the vein was wounded in like manner. Burrows[5] has seen the artery so injured that ligation was found necessary and thinks it possible that some of the cases of thrombosis of the femoral vein following the operation for inguinal hernia are the

results of such misadventure with the needle. I, myself, have seen such a case, with later occlusion of the femoral artery, resulting in gangrene of the leg and death. For the avoidance of this accident, or at least to reduce it to its minimum, it is necessary that only a round, half-curved needle (never a cutting needle) be used; that the needle be firmly held in the grasp of the needle holder; that the suture material be not too thick or too coarse; that Poupart's ligament be well exposed; that the blood vessels be depressed and held out of the way of harm by a flat retractor; and finally that the needle and sutures be introduced from within, outward, and never too deeply. Should one be so unfortunate as to have injured this vessel, it becomes necessary to expose it, by either the intra- or extraperitoneal route, and to suture the rent with a number 16 cambric needle, threaded with human hair or the finest silk, coated with vaseline. While the collateral circulation, carried on from above a ligature anastomosing with the vessels from below is good, the danger of gangrene is greater than when suturing is resorted to. The deep epigastric vessels are easily tied if wounded, unless the injury is inaccessible and located near the origin of the external iliac, when it becomes necessary to treat the condition in the same manner as an injury to the external iliac itself. Erdman[9] reports such a case in which he found it necessary to suture the rent in the iliac vessel in order to control the hemorrhage from the wound in the epigastric vessel. Usually, however, the deep epigastric can be tied without fear of risk.

Injury of the Spermatic Cord.—Damage to the spermatic cord is not uncommon during operations for the cure of inguinal hernia. This injury may include the vas deferens, the spermatic artery, the veins of the pampiniform plexus, or some of the accompanying nerves. It is also well to remember that the spermatic artery is a branch of the aorta, and that the right spermatic vein empties into the inferior vena cava and the left into the renal vein. It is extremely important, for the sake of the ultimate welfare of the testicle, that these vessels be handled with the utmost care and gentleness, so as not to injure them. A division of the artery may result in a complete atrophy or necrosis of the testicle. If torn, the artery can scarcely be united and had best be ligated. The careless handling of the veins, tearing, pinching, or bruising them, may be followed by thrombosis, swelling of the testicle, orchitis, atrophy, or hydrocele. The injuries are most likely to happen when separating the cord from its attachments to the sac. Careful, clean, sharp dissection with the knife is better than the use of the finger and gauze method. Judgment and care must also be exercised in avoiding constriction of the cord, especially at its exit from the external abdominal ring, as well as avoiding the catching of the vessels of the cord in the sutures of the conjoined tendon to Poupart's ligament. Seward Erdman,[10] in his notes of 1,093 hernia operations on males, found that 144, or 13.1 per cent, had scrotal tumefactions; fifty-one, or 4.6 per cent, were early hydroceles, demonstrated by aspirations, and there were ninety-three cases of other tumefactions in the scrotum, classified as distention of the veins above the testes, thrombosed veins, thickening of the tunica after excision and turning back of the same, hematoma, epididymitis and orchitis, of which the last nine proved or showed atrophy of the testicle. In these cases, where the vessels have become injured in one manner or another, swelling or tumefaction of the testicle will make its appearance in twenty-four to forty-eight hours following the operation. The atrophy does not manifest itself, however, until four to six weeks later, by which time the patient has usually left the hospital. Thus many of these cases are lost sight of, and the record of the progress of the patient remains incomplete, unless he, furious at his loss, returns to question the much embarrassed surgeon. One such case I recall distinctly. The accidental division of the vas deferens, while unfortunate, probably does no greater harm than to produce sterility of the divided side. Rolnick[11] has recently performed some very interesting experiments on the vas deferens in dogs. His conclusions are that the vas will regenerate itself if divided or resected for as much as one-half inch of its length, provided the sheath is left partly intact or united. If severed, the divided vas can be easily sutured and in each instance this should be attempted.

Injury of the Hernial Sac Contents.—As almost every abdominal organ has been found in the hernial sac it behooves the surgeon to be cautious in opening or transfixing it lest the organ be injured. In every case the sac should be opened and the organ replaced within the abdomen. If the omentum is adherent to the sac wall, it must be carefully liberated and ligated before returning to the ab-

dominal cavity. In dissecting away adherent gut, care must be exercised not to injure it. In cases in which the adhesions of the gut are close and extend to the sac wall, it is better to excise and leave portions of the sac wall attached to the gut, and to replace it, than to perforate or accidentally tear it. Should the bowel be accidentally injured, it must be repaired at once. Lembert or purse string sutures should be used, reinforcing the first row by a running suture, with finally a piece of omentum tucked over the wound to prevent leakage and adhesions. Similarly any organ thus injured must be repaired immediately. In ligating the sac or transfixing it, one must be careful not to include any tissues but the sac. The caput colon, appendix, ovary, and other organs have thus been cut off and not recognized until subsequently. Murphy[12] insisted on never ligating tissues outside of the canal, except under the guidance of the eye.

Injury of the Urinary Bladder.—A large number of examples of bladder injury, during the operation of inguinal hernioplasty, is to be found in the literature. These are frequently the result of inclusion of the bladder in the ligature of the sac, especially in direct hernias, where the inner wall of the sac is often in contact with the bladder; of tears when dissecting out the sac, and of puncture or incised wounds where the thin bladder wall is easily mistaken for the sac. The escaping urine is frequently erroneously mistaken for serum from the peritoneal cavity. It is also well to recall in operating upon infants and children that the bladder is situated higher than in adults. According to Baker,[13] the following conditions during the operation should make one suspicious of the nearness of the bladder: presence of an unusual amount of fat (extraperitoneal) in the inguinal canal; the large size of the hernia opening (out of proportion to the amount of herniated omentum or intestine); and that the hernia is more often of the direct type. Such fat as has been mentioned must always be liberated and never included in the ligature encircling the neck of the sac. Difficulty may be encountered in separating the hernial sac, and more especially posterior portion, from which the bladder is evolved. Free bleeding is likely to ensue. In suspicious cases, where urinary symptoms are present, methylene blue may be given for a few days prior to the operation. If during operation a suspicious tumor presents, the abdomen, according to Watson,[14] should be opened from above, and the tumor examined from the inside. A hypodermic syringe may also be used in these cases to aspirate, and the litmus paper test used. A sound may be passed, and the tip felt in the bladder, or the suspicious tumor may be distended by air or water injections. In operating in these cases, under local anesthesia, Watson[14] has observed, if traction is made on the sac and causes the patient to express a desire to urinate, it is a sign that the bladder is near and usually adherent to the inner side of the sac wall. Should the bladder be accidentally injured, no serious harm is done if it be promptly recognized and as promptly repaired. If, however, the injury be not recognized for twelve to thirty-six hours, the prognosis becomes serious. In the presence of painful and frequent urination, vesical, tenesmus, bloody urine per urethra, or oozing through the dressings, bladder injury must be suspected to have taken place during the operation. In a majority of the cases, where the bladder is found in close proximity to the hernia, its walls become so thinned out as to become totally unrecognized as muscle. In some cases, where the bladder forms part of the sac wall of an ordinary hernia, it may be entirely overlooked, and considered merely as a thickened patch in the sac wall itself. In fifty-seven cases of bladder hernia reported by Curtis,[15] twenty-three were recognized before injury; in four, it was not seen until injured; in two, it was not seen at all during the operation; in ten, it was mistaken for the hernial sac; in five, for a tumor or cyst; in three, for a thickened patch in the sac wall; in three, for properitoneal fat; in one, for degenerated omentum; and in one, for haustrum of the colon. Watson[14] advises, in cases of injury to the bladder, that it be caught immediately with hemostats and clamps placed across the opening. Compresses should be placed so that the escaping urine, if any, will not contaminate the wound or reach the abdominal cavity. The bladder opening should be closed with interrupted chromic catgut sutures in two or three layers. No suture, however, should go through the mucous membrane, which in closing must be inverted. The bladder is then anchored in the lower part of the wound. The contaminated tissues are swabbed with tincture of iodine, in order to produce adhesions, and all dead spaces carefully closed. A drain may be inserted down to the bladder, and permitted to remain for two or three days. A retention catheter is usually unnecessary, besides

being the source of considerable discomfort. Catheterization every four hours is sufficient.

In conclusion, permit me to quote from "Hernia and Its Radical Cure" by J. Hutchinson: "The radical cure of hernia is one of the most successful of all operations, one of the most frequently performed, and one of the greatest importance to the community." Hutchinson also emphasizes the fact that the operation is not a minor one, and that its real success depends on a painstaking technic rather than on a rapid performance. Since surgical accidents are, in the main, the result of ignorance, carelessness, misjudgment, and defective technic, or a combination of them, it behooves us not to consider this operation too lightly, but rather to consider each case separately, and to apply the operation best suited for that individual case, to take more time and more pains in order that every source of accident be carefully avoided and the purpose of the operation be successfully attained.

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DISCUSSION

DR. GUSTAV SCHWYZER (Minneapolis): Dr. Robitshek's paper is handling a very appropriate subject, interesting not only to the specialist in surgery, but also to the country practitioner. He must know of these dangers and accidents that will and have occurred in operations for inguinal rupture.

There really is no object in criticising Dr. Robitshek's paper. It does not call for criticism. I think it is of more value if we mention some of our cases emphasizing the very dangers referred to in the paper.

Looking over a period of thirty years or more, I was rather fortunate that I did not find any death records in my inguinal herniotomies, though I witnessed some deaths following operations done elsewhere. For instance, one distinguished surgeon operated for inguinal herniotomy, causing a thrombosis of the iliac vein. Death occurred within twenty-four hours due to embolism of the pulmonary artery. Evidently the iliac vein was pierced when placing the deep sutures.

Recently I had a case where the left ureter was dissected for a distance of about 2.5 cm. It was in a man of thirty-five years who had a high inguinal rupture. Anterior to the neck of the hernial sack we found a band-like structure about 2 mm. wide, rather flat. We excluded blood vessel and nerve tissue and took the same for the left ureter. It went in a direction toward the bladder on the inner side and could be followed on the outer side intra-abdominally. We had no trouble in finishing our operation by constantly guarding the ureter.

Good luck was with us in another case, in a man of thirty-four years on whom we amputated a well pedunculated diverticulum of the bladder while operating for inguinal hernia. The diverticulum appeared like a club-shaped piece of superfluous fat, but when cut through we noticed a lumen, the inside of which showed a smooth surface not like the mucous lining of the bladder. There was no fluid. The suture apparently tying off this diverticulum did not hold very well. For that reason we put a second suture solidly over the first one. No drainage was used. The healing was prompt and ideal. Blood in the urine following operation confirmed the diagnosis. We catheterized very frequently for two to three days and used a weak solution of silver nitrate.

A year ago I operated for a very large strangulated inguinal rupture in an elderly man. The content of the hernia was a great amount of filled small intestine. There was a very large inner ring and no canal as we find it in such cases. With the finger inserted in the ring, I was able to go clear around between the ring and its content. Still I was unable to replace the scrotal content into the abdominal cavity. I opened the abdomen and pulled on the strangulated loop from within and pushed with the other hand from without. In this way we could replace the strangulated scrotal content, which did not require any resection. The patient recovered, though he had a nasty scrotal infection.

It is well known to us that in strangulated hernia the bacteriological examination of the fluid in the tunica propria vaginalis is always positive for coli bacilli. For that reason we always use drainage of some kind. We never drain a simple herniotomy. In spite of this drainage the wound healing can be surprisingly prompt. This, for instance, we observed in a thirty-year-old man who presented a very large strangulated rupture with a great amount of gangrenous

small intestine. We resected one yard of small intestine, making an end-to-end anastomosis with the Murphy button. The patient left the hospital with his hernial wound well closed in two weeks.

DR. A. R. COLVIN (St. Paul): One has to hunt around very industriously for something to say in a paper that has been so thoroughly discussed. When Dr. Robitshek spoke of hernia operations being relegated to interns and the mistakes and accidents that might happen, it occurred to me that all the accidents that I have seen have been at the hands of experienced surgeons.

An eminent surgeon once said that there is no such thing as minor surgery. I am accustomed to say to interns and students with surgical aspirations, that most surgeons who are quite frank will say that they have had many of the accidents that they have been critical about others having had, and those they have not had, they are afraid they will have if they do enough surgery. It is perhaps the forgetting of this that even experienced men have to acknowledge the accidents of inguinal operations.

The last mistake I saw, in passing, was the opening of a sliding hernia of the cecum. Perhaps it is well to remember the happenings that are still beyond our control.

I shall never forget one poor fellow who came to me with both knees and ankles stiffened and still painful after four years with destructive non-suppurating arthritis, following phlebitis which was consequent on an operation for hernia.

DR. ARTHUR N. COLLINS (Duluth): A discussion on the merits of hernia operations, speaking to a title such as this, is incomplete without mentioning the very, very grave accident of infection. If there is any one operation that I hate to get an infection in, it is a hernia operation. It disturbs the whole complex. I don't know of any operation in the region of the abdomen where an infection is so poorly taken care of as in a hernia operation. I don't know of any place where infections in the abdominal wall carry with them the necessity for going back and doing the operation all over again. I think that the surgeon is perhaps a little too careless about puncturing the gloves. Every puncture of the gloves in a hernia operation should mean removing that glove and putting on a fresh one. This will contribute to less infections and more primary unions.

DR. G. G. EITEL (Minneapolis): Dr. Robitshek reminds us of the all-important points in which every one who is, or contemplates, doing the operation for the radical cure of inguinal hernia must have clearly in mind and should be able to fully carry out if the best interest of the patient is to be served. The operator must not merely have a good theoretical anatomical knowledge of this subject, but he must be able to recognize all tissue structures as he meets them. There must be no guesswork, and unless the operator has this knowledge he is not able to do that which should be expected of him as a surgeon.

There is no question but that many lives have been lost by bungling, incompetent, would-be surgeons, to say nothing of the many bad results which are the outcome of the lack of knowledge and skill.

The subject has been so thoroughly dealt with by the essayist as well as by my fellow discussers of the paper that I shall not presume to trespass further upon your time. I thank you.

THE PROGRESS OF CARDIOLOGY DURING 1924: A REVIEW OF THE WORKS OF CLINICIANS AND INVESTIGATORS IN THE UNITED STATES

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In this age of scientific progress, in which the cogs of clinical and laboratory investigations grind ceaselessly, it seems appropriate to record the achievements in diseases of the heart and circulation during the year just passed. Such a record should not satisfy us, but should stimulate more effort in the search for more accurate methods with which to solve the many unanswered problems relating to this important branch of medicine. The full importance of investigation along this line is realized when one recalls the fact that heart disease causes the largest number of deaths annually in the United States (about 155,000), that it also results in more or less continuous disability of 2,500,000 people, and is the greatest single factor in causing disability, dependence and death.

I. PREVENTION OF HEART DISEASE

Since the organization of the associations for the prevention and relief of heart disease in New York, Boston, Philadelphia, and Chicago, a national body, the American Heart Association, has been formed. This organization will be a vital factor in the campaign against heart disease by bringing clearly before the public the ways and means of prevention which, to educate the masses, must be fundamentally approached in terms of hygiene. In this connection, I wish to call attention to "Hygeia," published by the American Medical Association, which has made possible the most important advances of recent years in the education of the public in medical matters. The beneficial influence of this publication will be limitless.

Faulkner and White investigated rheumatic fever, chorea, and rheumatic heart disease, with especial reference to their occurrence in families. They studied the families of 200 ward and outpatients with rheumatic infections, comprising a group of 1,235. Their criteria with regard to previous rheumatic infection were: (1) the history of a definite attack of rheumatic fever with multiple involvement of joints, (2) definite choreiform movements, or (3) definite evidence of mitral ste-

nosis. Their study revealed that in seventy-one families (35.5 per cent), more than one member was affected with a rheumatic infection, or 8.79 per cent of 1,235 persons exposed were affected. For comparison they studied the families of seventy-five persons with no evidence of past or present rheumatic infection, but who were otherwise comparable. Positive evidence of rheumatic infection was found in 16 per cent of the families, and in 2.95 per cent of the individuals.

Denzer comments on the extreme rarity of rheumatic carditis in infancy and quotes Still, who did not observe it in children less than two years of age in a study of 1,027 children with articular and cardiac rheumatism. Denzer reports three cases, the patients being twenty, twenty-three, and twenty-four months old, respectively. In the two cases that came to necropsy, the characteristic Aschoff bodies were demonstrated in the myocardium, while in the other case the objective cardiac findings and the presence of subcutaneous fibrous nodules substantiated the diagnosis of rheumatic carditis.

McCulloch believes that children suffer from chronic heart disease due to changes in the heart muscle. These changes, in turn, are due to the action of a poison liberated by a focus of infection, usually in the nose, accessory sinuses, or tonsils. Many of these children have no further heart trouble, and may be restored to normal health. Usually they do not have characteristic rheumatic fever with objective signs in the joints, although they may have joint or muscle pains. McCulloch does not believe that these children ever have rheumatic fever.

In discussing the etiology of cardiovascular disease, Barnes emphasizes the importance of constitutional heritage in relation to children whose parents have "rheumatism" and cardiovascular diseases. He calls attention to the importance of infectious and bacterial diseases in children, with especial reference to their complete recovery after the removal of all foci of infection. He also calls attention to the causes of capillary spasms and hypertension, with special reference to defects in infants and older children, endocrine and reflex disturbances, autointoxication, and intestinal intoxication. He emphasizes the desirability of educating the laity with regard to the causes of cardiovascular diseases, of the importance of keeping well, and of the need of proper relaxation, recreation, work and exercise.

Woody's observations on the incidence of heart disease among negroes is interesting, as the incidence is on the increase. This is explained by the increase in acute infectious diseases, focal infections, and venereal diseases.

Miller believes that a definite relationship exists between sinus empyema and cardiac diseases, and especially between chronic valvular disease and subacute bacterial endocarditis.

II. ENDOCARDIUM

From a painstaking study of 220 cases of endocarditis, Clawson draws the following conclusions: Death from cardiac failure when the patient is less than forty years is practically always the result of a valvular injury. Endocarditis, which is at once associated with acute rheumatism, is rarely the cause of immediate death, and when death occurs it is usually the result of pericarditis or heart failure. Embolic processes are common in all forms of bacterial endocarditis, but most common in the subacute form. Embolic glomerulonephritis is rare except in the subacute bacterial type. Enlargement of the spleen with cardiac disease generally indicates an active inflammatory process in the valves, rather than a congestive phenomenon. Active involvement of the endocardium of the auricles and ventricles rarely occurs except in the subacute bacterial form. Pericarditis generally accompanies the rheumatic type of endocarditis. The acute bacterial form is chiefly the result of the invasion of the *Streptococcus hemolyticus* and the staphylococcus, while the subacute form results invariably from the *Streptococcus viridans*. Death in such cases usually results from cardiac failure.

Libman and Sacks describe a new form of valvular and mural endocarditis which deserves emphasis. The morphology and localization of the lesions differ from those in subacute bacterial, rheumatic, and other forms of endocarditis. In their cases all four valves were involved and there was a tendency toward involvement of the mural endocardium. The lesions invariably extended from the ventral aspect of the posterior cusp of the mitral valve along the adjacent mural endocardium of the posterior wall of the ventricle, and there were isolated areas of mural endocarditis in the right auricle and both ventricles. The vegetations were free from demonstrable organisms. The myocardium failed to show Aschoff or Bracht-Waechter bodies, and no glomerulonephritis occurred. This

form of endocarditis seems to attack young persons with previously normal valves, and runs a subacute course attended by fever and a secondary type of anemia.

In a series of sixty-eight cases of sepsis treated by repeated transfusion, Stetson reported eight cases of *Streptococcus viridans* endocarditis. Only one of the patients recovered.

In two cases of mycotic aneurysm, Reifenstein was able to determine the etiology quite accurately. One case, due to the gonococcus, was insidious in onset, protracted in duration, and presented all the classical signs and symptoms of septicemia; the other, due to the pneumococcus, ran an acute course and gave out relatively few localizing signs.

Talley and Lindsey, in a study of splenic enlargement associated with chronic cardiac disease, have observed that an appreciable splenomegaly is not a common clinical finding in the pure stasis of chronic cardiac failure by congestion. A distinct splenomegaly in chronic cardiac disease suggests recurrent endocarditis. Perisplenitis in chronic cardiac disease is commonly preceded by infarction, but the latter is infrequent with this condition. The presence of symptoms indicative of perisplenitis suggests either a recurrent infection or a well-defined mitral stenosis.

Kahn emphasizes the importance of distinguishing between the thrill of mitral stenosis and adventitious thrills of other abnormal conditions. In neurocirculatory asthenia the apparent thrill is due to diffusion of the apex beat as it strikes several rib spaces with a forcible and jerky movement. On palpation this systolic shock gives the impression of a presystolic thrill. If the stethoscope is placed obliquely on the chest wall so that its edge lies within an intercostal space and its mouth inclines toward either the upper or the lower rib, the rumble disappears.

In discussing true and false presystolic murmurs, Reid emphasizes the fact that there are two murmurs, one rather rare, which is produced by contraction of the auricle, and the other, more common, due to the first part of ventricular systole. The latter murmur is the result of regurgitation of blood into the auricle. Confusion of the true and the false presystolic murmurs leads to diagnostic errors.

III. MYOCARDIUM

Peshkin believes that the primary myocardial insufficency syndrome of asthma is an important etiologic factor in certain types of asthma in persons past middle life. A regular and persistently increased pulse rate, with a history of subjective symptoms indicating the earliest stages of myocardial failure and the onset occurring after forty years of age, is diagnostic of primary myocardial insufficiency asthma, when other causes of asthma can be excluded.

In a detailed study of 102 hearts in cases of noninfectious myocardial failure, Clawson has recorded various findings. The cases represented hypertension, chronic glomerulonephritis, right ventricular hypertrophy, defective valvular disease, syphilitic aortitis, and adherent pericarditis. The only anatomic changes were coronary sclerosis and myocardial fibrosis. Sclerosis of the coronary arteries was marked in 22.5 per cent of the cases, and myocardial fibrosis was marked or moderate in 20.5 per cent, and slight in 30 per cent. Myocardial fibrosis is usually the result of coronary disease, but occasionally slight degrees are noted in rheumatic infections. Myocardial strain (hypertensive or nonhypertensive) is not a cause of myocardial fibrosis. Syphilitic myocarditis is rare. Myocardial failure is rarely due to anatomic changes in the myocardium, but to exhaustion of the heart muscle.

Warthin investigated the hearts in sixteen cases of diphtheria that came to necropsy. The most constant lesion was a toxic parenchymatous hyaline degeneration or necrosis in many cases associated with fatty degenerative infiltration, and in some with cloudy swelling or simple necrosis. Complete regeneration or fibrosis may result in such cases. The toxin of diphtheria may affect conduction as well as the contractile mechanism, although no special affinity is shown for either.

The analysis of the cardiac findings in a group of patients with arthritis deformans by Boas and Rifkin revealed the fact that about 45 per cent had organic heart disease. Endocardial valvular disease occurred in 17.5 per cent of the patients, and of these, 28 per cent were less than forty years at the onset of the arthritis. Heart disease with arteriosclerosis of the valves or hypertension occurred in 26 per cent, and of these 4 per cent were less than forty years when the disease began. Of the patients more than forty years at the beginning of their illness, none had endocarditic lesions, while 63 per cent had arteriosclerotic heart disease.

In a clinical study of thirty-seven cases of com-

plete heart-block (Willius) it was found that the apparent etiologic factor in 62 per cent was arteriosclerosis, in 19 per cent rheumatic heart disease, in 15 per cent diphtheria, in 3 per cent influenza, and in 3 per cent the probable cause was not determined. Fifty-four per cent of the patients had Adams-Stokes attacks, 16 per cent presented symptoms of the congestive type of heart failure, 16 per cent complained only of dyspnea on exertion, 8 per cent had angina pectoris, 3 per cent had angina pectoris and Adams-Stokes seizures, and 3 per cent had no complaints referable to the cardiovascular system. Of twenty-two patients traced, 68 per cent died from heart disease an average of seven months after examination, and 23 per cent died during the Adams-Stokes attacks. Of the patients with Adams-Stokes attacks 73 per cent died from heart disease.

A case of so-called idiopathic cardiac hypertrophy in an infant of twelve months is reported by Carrington and Krumbhaar. A mild nephritis, myocardial fibrosis, and an anomalous coronary artery arising from the pulmonary artery are considered possible causes.

Boas and Dooneief, in discussing the mechanism of peripheral stasis in myocardial insufficiency, conclude that the chief cause for peripheral stasis and edema lies in the weakened cardiac contraction, and not in the back-pressure effects.

Levine and Sturgis observed five patients who presented a picture of heart disease who had been treated for heart trouble for a year or two previously. The advent of transient auricular fibrillation first directed attention to hyperthyroidism as the underlying cause of the symptoms. H. S. Plummer, of the Mayo Clinic, called attention to this diagnostic pitfall about ten years ago, with special reference to adenomatous goiter with mild hyperthyroidism. In this connection a paper by Eyster directed suspicion to early hyperthyroidism in patients presenting themselves for examination because of cardiovascular symptoms. Dameshek records a detailed study of the heart in hyperthyroidism, which is interesting and worthy of mention.

Bohan discusses the relation of tonus to cardiac dilatation and to the other properties of heart muscle. Hypertension and coronary disease appear to be common causes of dilatation. The symptoms vary according to the degree of dilatation.

The study of ball thrombi of the heart by Abramson is interesting and includes a full description of the literature on this rare condition. He accepts the criteria for ball thrombi as expounded by Welch, that is, entire absence of attachment and imprisonment, due to its size, and such consistency and shape as to prevent its lodgment as an embolism in the circulatory passage ahead of it. Including the case reported, only twenty cases were found in the literature. While thrombosis of the left auricle does not give rise to a typical syndrome, the following findings are very suggestive: mitral stenosis associated with marked disturbance of the general circulation, extremely feeble pulse, and gangrene or cadaveric coldness of the lower extremities. At the present time there is no way of distinguishing between a ball thrombus and other types of thrombi of the left heart.

IV. THE CORONARY ARTERIES, AND ANGINA PECTORIS

In determining the variations in the anastomosis of the coronary arteries and their sequences, Oberhelman and LeCount studied twenty-six human hearts, chiefly from males who died between the ages of fifteen and seventy years. The hearts were cooled for from twelve to twenty-four hours to allow rigor mortis to disappear, then the coronaries were injected with metallic mercury under a pressure of from 125 to 150 mm. Fluoroscopic and microscopic examinations were made. A precapillary anastomosis between the branches of the two coronary arteries was demonstrated by the escape of metallic mercury from the mouth of one of them in from one to three minutes after its introduction into the other. The authors believe that at least two highly important factors are involved in disease of the coronary arteries and their ramifications, each subject to so much variation as to be comparable to the "variants" of mathematics. One is the normal difference in the arterial bed of the myocardium with regard to the anastomosis between the branches of the two coronary arteries. The other is the rate at which narrowing or occlusion of the branches of either or both arteries occurs, for with gradual occlusion, an enormous compensatory anastomosis may develop.

Drury and Smith, in their studies on the nerve supply of the coronary arteries of the tortoise, found that the arteries could be constricted by direct application of adrenalin in dilutions of 1: 10,000 or even 1: 100,000. The smaller branches were more susceptible than the larger ones. Stimulation of either vagus opened the arteries to their

full extent, and general or local atropinization abolished the vagal reaction.

A correlation of clinical and necropsy data was made by Willius and Brown in eighty-six cases of coronary sclerosis grouped thus: (1) typical angina pectoris, 24 per cent; (2) atypical angina pectoris, 2 per cent; (3) progressive myocardial failure, 26 per cent; (4) angina pectoris and progressive myocardial failure, 8 per cent; and (5) occult coronary sclerosis, 40 per cent. In the last group, the diagnosis of coronary sclerosis was not made by the internist, and a careful review of the records of these patients revealed insufficient subjective or objective evidence of heart disease to establish the diagnosis with the usual clinical methods of examination. The thoracic aorta was diseased in 99 per cent of the eighty-six cases; there were sclerosis, atheroma and ulceration in 90 per cent, and syphilis in 9 per cent. The abdominal aorta was sclerotic, atheromatous and ulcerated in 21 per cent of the cases, and in one case there was a nonsyphilitic aneurysm. The cardiac valves were involved by sclerosis, fibrosis, or atheroma in 50 per cent of the cases, and in one case there was an acute vegetative tricuspid endocarditis. The aortic valves were most commonly affected and the mitral and tricuspid valves in the order mentioned. There was evidence of myocardial degeneration in all cases. Disease of the pericardium was found in 9 per cent of the cases, and consisted of chronic adherent pericarditis in four cases, chronic fibrinous pericarditis in two, terminal fibrinous pericarditis in one case, and obliterating tuberculous pericarditis in one. Arteriosclerosis of the peripheral vessels was evident in 70 per cent of the cases, and arteriosclerosis of the kidneys in 37 per cent. Cerebral arteriosclerosis was found in thirteen of the fifteen brains examined. Nephritis was present in varying degrees in 53 per cent of the cases. Hypertension occurred in 31 per cent of the eighty-six cases. The average systolic blood pressure was 183, the average diastolic pressure 111, and the average pulse pressure, 72. The height and weight of forty-nine patients were available; 27 per cent were distinctly obese.

Sudden death occurred in 37 per cent of the cases in the series. The highest incidence occurred in patients with typical angina pectoris, 38 per cent of the patients dying suddenly. In order of frequency, the other clinical types of coronary sclerosis attended by sudden death were: occult coronary sclerosis, 21 per cent; angina pectoris with progressive myocardial failure, 19 per cent; progressive myocardial failure, 17 per cent, and atypical angina pectoris, 6 per cent. Death was the result of gradual cardiac failure in 15 per cent of the cases. Causes other than heart disease were responsible for death in 48 per cent of the cases. Of the patients examined electrocardiographically, 68 per cent manifested significant graphic abnormalities.

Gordinier reports thirteen cases of coronary arterial occlusion and calls attention to the definite syndrome which occurs. There is sudden, severe anginoid pain, substernal or located in the upper abdomen, a pinched, ashen-gray or very pale facies, often associated with the sensation of impending death. There is frequently an acute emphysematous distention of the lungs, with dyspnea or extreme orthopnea and moist crackling râles at the bases of the lungs, together with the evidences of the acute onset of cardiac decompensation. An easily compressed thready pulse, presenting any type of arrhythmia, and a sudden drop in the systolic pressure often occur. The cardiac impulse, if detectable, is a diffuse feeble tap with distant heart sounds, and often a tic-tac or gallop rhythm. A localized pericardial friction rub, which is evanescent, appears as early as a few hours or a day or two after the onset of the attack although it may be inaudible if the infarct is on the posterior aspect of the heart. A fever of short duration associated with a polymorphonuclear leukocytosis invariably occurs. Inversion or iso-electric T waves and arborization block, are often disclosed by electrocardiographic study.

The foregoing symptoms and signs, in the presence of a large, tender liver and evidence of pulmonary infarction are suggestive of thrombosis of the right coronary artery or its branches, whereas the sudden onset of pulmonary edema or recurring attacks, together with sudden arterial plugging of the cerebral vessels, viscera or extremities, is suggestive of thrombosis of a branch of the left coronary artery.

In a purely theoretic manner, based somewhat on the ideas of Albutt, Reid attempts to explain the mechanism of angina pectoris. He claims that a failure of the reflex dilatation of the peripheral blood vessels leads to a sudden rise in pressure in the first portion of the aorta and the cavity of the left ventricle. This increased pressure in turn irri-

tates the local nerve and plates which respond by pain referred to the arm, shoulder, and so forth. This explanation is interesting, but fanciful in the light of the present knowledge of angina pectoris.

V. PERICARDIUM

The observations by Gauchat and Katz on pulsus paradoxus with special reference to pericardial effusions are based on clinical and experimental data. They call attention to the fact that pulsus paradoxus occurs with abnormal conditions of the respiratory system, such as partial tracheal or bronchial stenosis, bronchiolar spasm, laryngeal croup, pneumonia, and chronic emphysema. It also occurs with pathologic affections of the pericardium, such as mediastinopericarditis with thoracic adhesions, with pericardial effusion, and disappears after paracentesis. It is caused primarily by changes in the intrapleural pressure. Pulsus paradoxus associated with pericardial effusion is frequently observed when patients do not complain of respiratory discomfort. The authors claim that the condition, when unaccompanied by exaggerated respiratory effort, is a diagnostic sign of pericarditis with effusion. In their experimental studies, the authors found that traction exerted anywhere on the pericardial structures may produce pulsus paradoxus, the degree of change in the pulse depending on the tension. They were also able to produce the condition by first producing pericardial effusion.

The experimental work of Reid on the constriction of blood vessels has a definitely practical application to adherent pericarditis. Reid found that a constricting metallic band on the common pulmonary artery of dogs does not affect the integrity of the wall of the vena cava, but leads to rapid necrosis of the wall of the aorta, and, as shown by one case, to much slower disintegration of the pulmonary artery. In this case, constriction by an aluminum band for a period of two and a half years led to hypertrophy of the right ventricle. Partial or complete occlusion of any large artery by a metallic band or a ligature invariably resulted in local necrosis of the vessel wall. Reid attempted to devise a method for producing partial or complete occlusion which would not result in necrosis. He was able to produce partial occlusion of the aorta of dogs, by Halsted mattress sutures of silk, and this occlusion persisted. He also completely occluded the aorta by anchoring fascial plugs in the lumen with silk sutures tied very loosely, but the vessel wall below and at the side of an occluding plug underwent marked atrophy.

Oppenheimer has advocated the production of artificial pneumopericardium following pericardial paracentesis. He cited one case, and said that the injection of air following drainage gave greater relief than aspiration alone and that the presence of air delayed the reformation of exudate.

An interesting case is reported by Youmans and Merrill, in which roentgenographic studies during life permitted them to identify calcification of the pericardium. They believe that these cases are essentially examples of advanced stages of polyserositis, tuberculous in origin. They say that rheumatism may produce a similar condition.

(To be continued)

Yadil.—This is an international fake of British origin. The advertising campaign for Yadil reminds one of Sanatogen in those palmy days when the public could be persuaded to pay a dollar for a few cents worth of cottage cheese. As Sanatogen was the apothesis of cottage cheese, so Yadil is supposed to be a glorified and esoteric form of garlic. A part of the Yadil advertising campaign is an alleged history of garlic as a curative agent. Just what the theory of its use may be is not clear. Possibly the basic idea is that no self-respecting germ will want to tarry in an organism saturated with garlic. Yadil is put on the market by Clement and Johnson Bros., of London. The concern has a subsidiary company for its publicity, known as the Yadil Press, Limited (formerly called "Quality Press, Limited"). The American agents are E. Fougera and Co., New York. In the British Isles, newspapers and magazines are carrying full page and middle page spreads for Yadil for tuberculosis, for cancer, for scarlet fever, for gonorrhea, and for what-have-you. The British newspaper, The Daily Mail, which has refused Yadil advertising, published in its issue of July 22, an exposure of Yadil, written by Sir William J. Pope, senior professor of chemistry in the University of Cambridge. Whereas the manufacturers claim that Yadil is "Trimenthanal Allylic Carbide," and declare that it is of entirely harmless vegetable origin, its active principle being natural essential oil of garlic. Professor Pope, after an analysis of Yadil, stated that (1) it is not "Trimethanal Allylic Carbide," (2) that it consists of about 1 per cent formaldehyde, 4 per cent of glycerin, 95 per cent of water and a smell. According to Professor Pope the smell can be closely imitated by adding to one hundred tons of water, one ounce of oil of garlic. He also discusses the testimonials both from physicians and from laymen and shows the utter worthlessness of the testimony. In another article in The Daily Mail, Professor W. E. Dixon, of the University of Cambridge, emphasizes that the basic drug in Yadil is an irritant poison with cumulative effects, and characterizes some of the medical evidence for Yadil as nonsense. (Jour. A. M. A., Aug. 16, 1924, p. 550.)

THE PRE-OPERATIVE TREATMENT OF HYPERTROPHY OF THE PROSTATE*

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The average mortality following prostatectomy, when pre-operative and post-operative treatment are under the direction of an urologist, is about 3 per cent. The mortality in some hospitals where general surgeons and general practitioners operate on prostatic patients is as high as 20 per cent. This difference is not due to the better surgical skill of the urologist, but to the careful pre-operative care that he has learned to give his patients before operation is considered.

The present method of treating prostatics as practiced by urologists is standardized and brings about such good functional results and occasions such a small mortality that little improvement can be expected in this branch of surgery until patients are operated on earlier. The urologist's present problem is the education of the general practitioner and the prostate patient so that relief will be sought when the first symptoms are noticed and will not be delayed until residual urine accumulates and renal damage occurs.

GENERAL PHYSICAL SURVEY

Pre-operative treatment consists first of a general physical survey. This examination may be made by the urologist, supplemented by special advice where indicated. My routine is to have this study made by an internist who considers and is interested in the patient as a whole and will find diseased organs and pathological conditions, whether in the urologic tract or not. Particular attention is given to the examination of the heart and the kidneys.

UROLOGIC EXAMINATION

Following the general physical survey, the urologic examination is made. This should include a complete roentgenogram of both kidneys, ureters and bladder, together with cystoscopy and ureteral catheterization. About 4 or 5 per cent of prostatics have renal stones and 12 per cent have bladder stones. These complications should be known by the surgeon, as they may change the pre-operative plan of treatment. A clear roentgenogram, in the majority of cases, will demonstrate urinary stones if present.

Cystoscopy may not be done when the patient has a large amount of residual urine or when it is thought that this manipulation may introduce additional infection or precipitate an attack of uremia. However, at some time during every pre-operative treatment, cystoscopy can be safely done. With the cystoscope, one can determine when minor procedures may be done through the urethra which, if indicated, effect a more complete cure than prostatectomy. The pre-operative treatment plan may be changed or operation may be contra-indicated if papilloma, carcinoma, diverticulum, tabetic bladder or other bladder lesions are encountered. Such data are of great importance and can only be ascertained with the cystoscope.

The physician is not always able to make a diagnosis of hypertrophy of the prostate by rectal palpation alone. The median and bilateral lobes may enlarge into the bladder and urethra, so that they produce urinary difficulty and residual urine without a palpable enlargement per rectum. When such conditions exist, the diagnosis can only be made with the cystoscope.

RENAL FUNCTION

The most important consideration in pre-operative treatment is kidney function. When considering renal function in relation to prostatic hypertrophy, I mean renal damage produced by back pressure from residual urine with or without infection. A majority of my patients have some demonstrable renal damage which needs treatment before operation can be advised. Between 12 and 20 per cent of all patients seeking relief from prostatic symptoms will not be considered safe operative risks because of poor renal function or some secondary physical defect, which cannot be improved during treatment. Many operative deaths are attributed to other causes when poor kidney function was not ascertained before operation. In my experience, the amount of kidney damage is directly proportionate to the length of the history and the amount of residual urine, although renal damage may be found associated with as little as 200 c.c. of residual urine.

Before pre-operative treatment is started, the surgeon must have a fair estimate of the renal function. Patients who have very poor renal function

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indicate this fact so that when they are first seen the diagnosis is easily made. These old men look sick, their color is bad, the tongue is thick and dry, they have no appetite, have lost weight and may have an urinous odor about them which most often arises from the expired air. They are mentally slow and breathe rapidly. When symptoms of renal damage are not so evident, I rely upon blood chemistry. An estimate of the amount of creatinin and urea present in 100 c.c. of blood has proved, in my experience, the best index of the functional capacity of the kidneys at the time the test is made. The phenolsulphophthalein test of Rowntree and Geraghty is very useful, but cannot be used at all times unless the bladder drainage is continuous or complete. None of these tests indicate what the kidneys can do, but merely what they are doing at the time. A careful study of repeated functional tests before, during and following pre-operative treatment, together with the general condition of the patient after this treatment is completed, will indicate the true renal capacity. A patient who has submitted to pre-operative treatment and whose functional tests indicate a normal function, has a renal reserve which will carry him through the ordinary manipulations incident to the preparation and the operation for removal of the prostate.

THE HEART

The heart muscle must be carefully watched. Heart lesions are second in importance, as a result of hypertrophy of the prostate with residual urine. Swelling of the ankles may be noticed during the pre-operative treatment or when the patient first gets out of bed after gradual decompression. Such a patient should get around slowly and should receive digitalis until the heart muscle can carry on. When in doubt concerning the heart function, an internist is consulted. In some instances, the electrocardiograph is necessary before a correct diagnosis is possible.

BLOOD PRESSURE

The blood pressure must be taken frequently. A recent study by O'Conor[1] indicates that blood pressure is materially affected by renal decompression and prostatectomy. This author reports high blood pressure occurring in many patients which became normal before leaving the hospital following prostatectomy. Patients who have a permanently high blood pressure for their age should not be operated on. This is equally true of patients with a low blood pressure: 110 systolic and 60 diastolic is the low level set by B. A. Thomas.[2]

BLADDER DRAINAGE AND RENAL DECOMPRESSION

Relief from residual urine and improvement in renal function go hand in hand and are accomplished by gradual drainage of the bladder. This is known as renal decompression and is accomplished in three ways: (1) by fractional catheterization, which may be repeated three or more times daily; (2) by a permanent urethral catheter; (3) by supra-pubic drainage, either fractional or total.

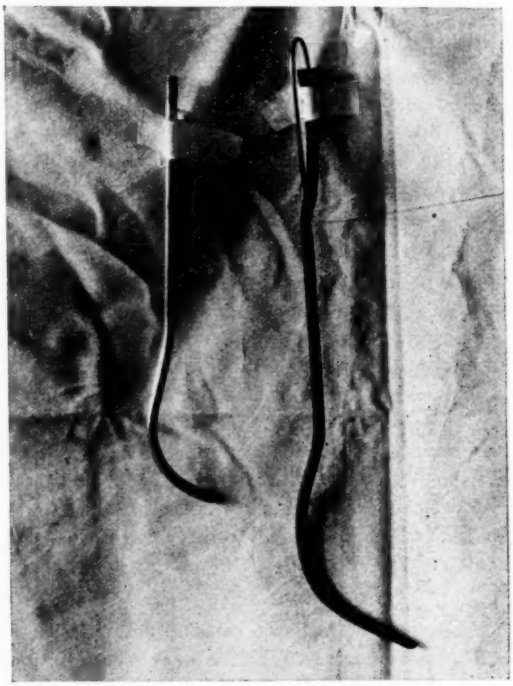

Fig. 1. Double curved prostatic catheter. Steel catheter guide introduced into soft rubber catheter.

Frequent catheterization with drainage of part of the residual urine is troublesome and many patients object to it. If too much urine is withdrawn at one time, this may quickly reduce the pressure on the kidneys, which should be avoided. With this method, one cannot quickly control the pressure of residual urine if complications arise.

A permanent urethral catheter is the method of choice for bladder drainage and kidney decompression. I use a soft rubber catheter of 18-20 F size and always cut an extra hole about one-half inch proximal to the usual one. When in the urethra,

the catheter is held in place with adhesive plaster or tape. A piece of adhesive 7 inches long and 2.5 inches wide is torn or cut in two places for a distance of 4 inches, which makes a three-tailed piece of tape. The end that is not torn is made to adhere to the skin just above the root of the penis. The middle tail is carried downward over the superior surface of the penis and onto the catheter. The side tails are carried around the penis and then around the catheter. A piece of adhesive, 4 inches long and 2 inches wide, is torn in like manner and applied to the skin of the under surface of the penis. This arrangement will anchor a catheter in the urethra so that it comes out with difficulty. The skin where adhesive tape is supposed to adhere should be carefully washed with a sponge containing a small amount of benzine. Before the adhesive strips are permanently adjusted, the catheter should be irrigated so that one is sure it is going to drain. The solution which is injected should return at once if the catheter is in its proper place. If it does not drain, it must be introduced farther into the bladder or pulled out a short distance. It is sometimes very difficult to place a catheter so that it will drain constantly. If bleeding occurs, clots may interfere with the drainage and necessitate frequent irrigation. When the bladder is not to be drained entirely and gradual decompression is to be practised, a small snap or clamp may be put on the catheter so that at regular intervals a small amount of urine may be withdrawn.

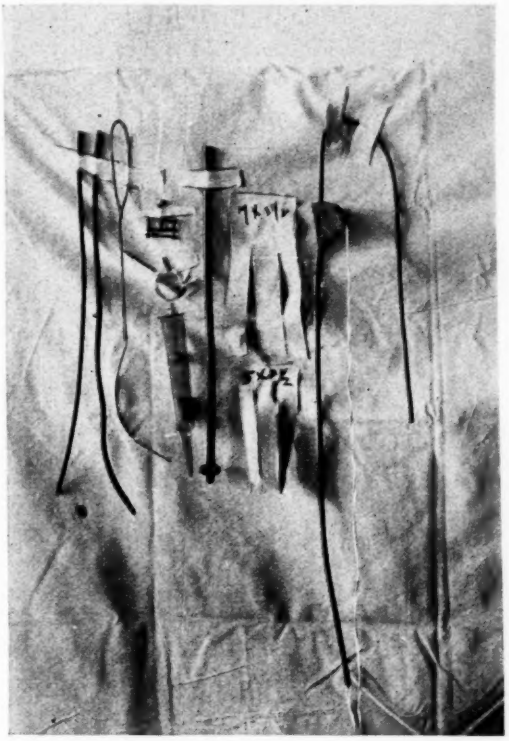

Fig. 2. From left to right: Ordinary rubber catheter with one eye, rubber catheter with extra eye—about one inch from end, mandarin or catheter guide, snap which acts as a sphincter, half ounce syringe used for irrigation, mushroom-end catheter for suprapubic drainage, adhesive strips used for anchoring catheter in urethra, Pilcher bag.

The passage of a soft rubber catheter when the prostate is enlarged is sometimes troublesome. When difficulty is encountered, a mandarin or catheter guide may be used, or a double curve metal catheter may be passed. The thumb of the left hand should follow any instrument through the urethra and perineum until the tip is beyond reach when the index finger is inserted into the rectum. In this manner the end of a sound or catheter is constantly felt and therefore under control. Because a metal sound is rigid, its tip will do less damage than one with a flexible shaft. One must be doubly careful not to traumatize the urethra. Catheters of all sizes and shapes should be tried. However, if only one instrument is at hand, it should be a double prostatic curve metal catheter.

If decompression is to be done by gradually and constantly reducing the pressure of residual urine, Van Zwalenburg's[3] method is used. This consists in forcing the urine through a long tube to a receptacle which is higher than the patient while lying in bed. An ordinary pail of one quart capacity or an iron enema can, 4 feet of rubber tubing with two glass connectors and a Y shaped glass tube complete this equipment. After the urethral catheter is in place, it is connected by one of the glass connectors to the 4-foot piece of rubber tubing. To the proximal end of this rubber tubing is attached an arm of a Y glass tube. The other arm of the Y is hooked over the edge of the enema can so that the base of the Y protrudes into the air. The height of the can is raised, so that when the patient inhales deeply, the urine comes out in drops. At this level, coughing will cause the urine to come in a stream for a few seconds following the cough. If the early signs of uremia, which are dry tongue, sleepiness and slowed mentality, are

not observed, the height of the enema can is lowered about two inches daily. In this manner, more of the residual urine is withdrawn each day, which reduces renal pressure. The second day after the bladder is completely drained, the patient is encouraged to get out of bed for a short time and as soon thereafter as his strength will permit he should walk around.

As soon as decompression is started, or better the day before, the patient should be urged to drink quantities of water. Five thousand c.c. is an average amount of intake. While the patient is in bed, continuous proctoclysis should be used. When the blood chemistry reveals a high urea and creatinin, the patient may take as much as 7,000 to 10,000 c.c. of water or fluids in twenty-four hours. Five hundred c.c. of 5 per cent bicarbonate of soda and 5 per cent glucose may be given every twenty-four hours. This solution should be given continuously if acidosis is feared. The intake and output must be carefully watched. The patient is encouraged to eat a full diet. Blood pressure and heart action are frequently tested during and after the decompression. If the patient has sufficient renal tissue to warrant operation, he will gradually improve in general physical condition.

In some cases there is an initial decline in the patient's general condition during the decompression so that the first signs of uremia are present. Urea and creatinin increase in the blood and phenolsulphophthalein output becomes lower than before decompression was started. When this occurs, the intake of fluids is increased, the heart muscle is stimulated and the pressure exerted by residual urine is not lessened or may be increased. The greatest medicine at this time is plenty of good water, which should get into the circulation by mouth, by proctoclysis, by hypodermoclysis or intravenously. As soon as the symptoms of approaching uremia have disappeared, the decompression is continued.

If the patient has insufficient renal tissue, his convalescence from decompression is stormy and slow. The blood urea and creatinin continue high, the phenolsulphophthalein does not increase and his general condition improves slowly if at all. Some patients may improve in general condition without improvement in blood chemistry and phenolsulphophthalein output. The prostatic's general condition and his ability to handle water after passing through thorough pre-operative treatment are major indicators of his inability to withstand operation.

SUPRAPUBIC DRAINAGE

Routine two-stage operative technique is, in my opinion, a mistake. About 10 per cent of my patients require temporary suprapubic drainage. This

Fig. 3. Catheter anchored in urethra with snap in place which is used as a sphincter.

becomes necessary when a permanent urethral catheter cannot be tolerated, when the patient has a bladder stone or other complication and when it is impossible to prepare him so that his blood chemistry, renal functional tests and general condition approach normal within an average time. With a suprapubic drain, the patient is able to take care of himself better over a long period of time than with an urethral catheter. Gradual removal of residual urine may be practised with this method of drainage. The suprapubic tube may be introduced into the bladder through the cuff of a trocar and immediately clamped. Gradual decompression may then be started, the technique being the same as that used when an urethral catheter is employed. When suprapubic drainage is necessary, local anesthesia or gas is used. Blindly push-

ing a trocar through a skin incision and into the bladder should be avoided. The incision in the skin should be long enough so that the peritoneum may be pushed back if in the way and so that the bladder may be recognized before the trocar is introduced. In my experience, the mortality from suprapubic drainage during pre-operative treatment is higher than when a permanent catheter is used. It is possible that the incision opens additional avenues of absorption and that the opening into the bladder does not permit of complete control of the residual urine during decompression. Again the suprapubic space is exposed to infection, all of which may add extra hazards which are too much for the overburdened kidneys and heart to overcome.

EPIDIDYMITIS

Epididymitis is a troublesome complication, which may be prevented by ligating both vasi before pre-operative treatment is started. This procedure is not permitted by all patients, even when they are told that most prostate operations produce sterility. Routinely, I advise my patients to wear a well fitting suspensory bandage both night and day. Epididymitis always prolongs the pre-operative treatment at least two weeks. An ice bag and rest in bed are routine treatment for this condition. Occasionally, it becomes necessary to drain an abscess of the epididymis. In my experience, suppuration is frequently present.

Fig. 4. Catheter anchored in urethra showing attachment of bottle for continuous drainage when the patient is ambulatory.

INFECTION

Infection in the urinary tract may be a troublesome complication during pre-operative treatment. Many deaths are caused by new or added infections in the kidneys, which condition overwhelms these already overburdened organs so that uremia and death result. Beware of the patient with a large amount of residual urine, which is clear and contains no infection. Such a patient after the least urethral or bladder instrumentation, may have a very severe reaction with chills, fever and the first symptoms of uremia. Patients with uninfected residual urine are not vaccinated or immunized against the ordinary organisms, which are always present in the bladder and kidneys. The introduction of a catheter not only introduces infection, but the trauma in the posterior urethra opens up at once avenues of absorption, which takes place quickly.

When renal infection occurs, dilution of the toxins is accomplished by the introducing of quantities of water. Urotropine used intravenously has been very helpful. I use Formatone, which is a trade name for the intravenous urotropine product. Mercurochrome 1 per cent may be introduced intravenously in severe cases. I use from 10 to 20 c.c. of this solution, the amount depending upon the weight of the patient and his general condition.

To control infection in the bladder and urethra, I inject through the permanent catheter two or three times daily 2 per cent mercurochrome. The catheter is clamped after each instillation for ten minutes, so that the mercurochrome cannot drain out at once.

HOSPITAL SURROUNDINGS AND NURSING

If the patient is away from home, provide amusement for him and see that he has men of his age to talk with. Many patients have given up hope and lost courage because of lonesomeness. Large hospitals that cater to urologic cases should have a small pavilion consisting of four to six sleeping rooms, one dressing room, sitz and tub baths, all

under the care of a carefully trained male nurse. Even where special female nurses are in attendance on one patient, a well trained, tactful male nurse should be on constant call. Such a man is invaluable if he is well trained. His duty is to make the old men happy and comfortable while they undergo their long pre-operative treatment and post-operative convalescence. The replacement and cleansing of catheters, frequent changing of dressings so that the patient is free from odor, and all like attentions which tend to make these old men happy and contented, are important factors in shortening their convalescence.

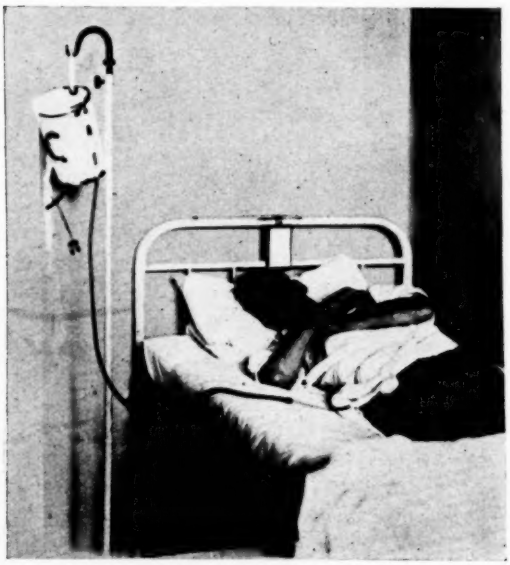

Fig. 5. Beginning of gradual decompression. Van Zwalenberg method.

MORTALITY

The operative mortality following prostatectomy has been reduced to an average of 3 to 4 per cent. Many urologists report series of 200 cases without a death. This is accomplished by pre-operative treatment and selection of cases for operation. It is difficult in the borderline group to differentiate a safe risk from a poor one, which judgment comes with experience. Patients in this borderline group, together with those who die from the accidents incident to any surgical operation performed on old subjects, constitute our operative mortality.

If all old men with hypertrophy of the prostate are considered, the total mortality will amount to about 20 per cent. This total mortality has not become less in recent years. We have learned to separate the bad risks from the good ones, so that the operative mortality is low, but as yet we do not get the prostatic to the urologist early enough so that renal damage and damage to the heart from residual urine and infection may be prevented. Patients with hypertrophy of the prostate deserve better attention and should be considered for operation as soon as a diagnosis is made. All of us will agree that if we could operate upon the prostatic during the onset of his symptoms, or as soon as a diagnosis can be made, not only the operative mortality, but the total mortality would be less. The early operation is not only desirable, but will put back into active, useful life, 10 to 15 per cent of all patients who now die from this condition. Urologists feel that this is the step that will bring about further progress in their treatment of the prostatic.

TO SUMMARIZE

1. Prepare all patients with hypertrophy of the prostate before operation. This consists of: (1) complete general physical survey; (2) urologic study, to include roentgenography and cystoscopy; (3) reduction of residual urine and back pressure on kidneys by decompression; (4) attention to complications as heart action, blood pressure, infection, epididymitis, etc. This produces a readjustment in physical condition so that poor surgical risks from any cause are quickly recognized and are not subjected to prostatectomy.

2. Careful pre-operative treatment of patients with prostatic hypertrophy results in a very low operative mortality (less than 3 per cent) and a much reduced total mortality.

3. The operative mortality will be less than at present and total mortality greatly reduced if sufferers from enlarged prostate will seek relief early. The general practitioner should advise his prostate patients to submit to operation as soon as a diagnosis can be made.

CASE REPORTS

CASE No. 1.—R. E. J. Age 54.

Preliminary complaint was discomfort after eating, with burning pain in epigastrium and sour regurgitation. Frequent sufferer from hay fever.

Family History.—Negative except that one member of the family had died from cancer.

Previous Diseases.—Operation for appendicitis with no infection.

General Physical Examination.—Negative. A gastric an-

alysis and roentgen studies of the gastro-intestinal tract were made.

Diagnosis.—Ulcer of duodenum or gallbladder infection.

This patient was put on management and returned to his home. The management controlled his gastro-intestinal symptoms so that he was free from trouble until one month later, when he came into the hospital with acute urinary retention. At this time, he stated that for the past month he had had slight frequency. After this attack was relieved, the patient returned home and did not have another attack of acute retention, but did have frequency of urination every two hours with some dribbling. Following the passage of the catheter for the acute retention, he developed an acute epididymitis. Two months later he was examined again, at which time only one-half ounce of residual urine could be found. During the interval his physician has been irrigating the bladder so that the residual urine had greatly decreased. This patient at the time he entered the hospital did not have the usual pre-operative treatment, because of the small amount of residual urine. Fractional catheterization was done rather than constant drainage of the bladder. A cystoscopic examination was made which revealed a large bilateral enlargement of the prostate. There was cystitis and some trabeculation of the bladder. No diverticuli or stones could be seen. An *x*-ray examination of both kidneys, both ureters and the bladder was negative.

After twenty-four days of preparation, the blood chemistry, P. S. P. test and the patient's general condition had all improved so that we were sure he was a good operative risk. The usual suprapubic operation was done, the Pilcher bag was used to control hemorrhage and a suprapubic drain was put into the bladder. These were removed after forty-eight hours. The distension of the bag was relieved after twelve hours and after twenty-four hours. A catheter was put into the bladder through the urethra when the bag was removed. The bladder and the suprapubic wound were frequently irrigated with a solution of 2 per cent mercurochrome to prevent infection.

The patient was out of bed on the fifth day and convalesced very rapidly. His wound healed quickly, but opened a few times and on the twenty-second day following operation was completely healed. The patient's post-operative history is good. He says that he has no frequency of urination and he is able to urinate freely and without trouble.

Urinalysis when the patient was first seen was negative. Following the acute retention, there was a quantity of pus and albumin. Pus was continuously found in the urine during the operation and for a few weeks following the removal of the prostate. At the present time the urine is free from pus. The first blood chemistry showed a creatinin of 1.5 and urea nitrogen of 25.3. Two weeks later urea nitrogen had decreased to 23.9 and creatinin 1.8. Nine days later urea nitrogen had decreased to 19.9 and the creatinin to 1.6. P. S. P. test taken on entrance showed 20 per cent in two hours and increased to 47.5 per cent one week later.

I wish to call attention to the age of this man and to the fact that he was operated upon shortly after his first attack. His bladder and kidneys were not infected, as is usual with old standing prostatics. His bladder was not distended, so that it had not lost all of its tone. This is evidenced by the complete relief which this patient has had following his operation. His general health is excellent and his only complaint at this time is an occasional upset with his stomach, which is controlled when he uses bismuth and soda.

CASE No. 2.—E. S. Age 71.

Family History.—Practically negative.

Past Illnesses.—Typhoid at age of thirteen, otherwise negative. Married forty-two years and has two children. Habits are good—uses tobacco moderately and no alcohol. No history of venereal disease.

Present History.—Began five years ago, at which time patient first noticed frequency of urination. Six months before operation, the frequency had increased to once per hour. At one time the patient urinated twenty times at night. No blood or pus was noticed. During the last year and a half, the patient's condition was poor. He had lost weight and strength.

Physical Examination.—Skin had a yellowish tint. Patient had a dry tongue and looked sick. He had no control of his abdominal muscles, which were constantly contracted. The heart and chest examination was negative, including fluoroscopy. Teeth were all false. Prostate felt by rectum was enlarged one and one-half on a scale of four, not nodular or firm. Blood pressure was 150/95. Blood chemistry when the patient was first examined showed urea nitrogen 44.5—creatinin 4.1. Hemoglobin was 54. Urine contained four plus albumin and too many pus cells to count in the high power field.

This patient was sent to the hospital and gradual decompression was done. *X*-ray did not show evidence of stone in the kidneys or bladder. He was not cystoscoped because his condition was poor and this examination might precipitate an attack of uremia. With the permanent catheter anchored in the urethra and with the Van Zwalenburg method, the residual urine was gradually removed. Two days following the introduction of the catheter, the patient's condition was not good. His tongue was dry and his mentality was dulled. His appetite was gone and he looked badly. At that time the urea nitrogen had ascended to 123.9, the creatinin had decreased to 3.0. When the decompression was started, this patient was given no less than 5,000 c.c. of water per rectum and by mouth. After seven days, the pressure had been gradually reduced, so that the urine was allowed to come out normally. Ten days following the beginning of the decompression, the blood urea had decreased to 96.9 and the creatinin to 2.9. The patient was allowed to get out of bed, but his intake was constantly watched so that he averaged 6,000 c.c. of water in every twenty-four hours. Seventeen days following decompression, the urea nitrogen had dropped to 83.4 and the creatinin to 2.3. This patient's blood pressure was frequently taken and was not found to be above 150 systolic. The patient's condition improved so that the twenty-second day following his decompression, he was allowed to go home with a permanent catheter still in the urethra. He returned to the office in a week, at which time his pulse was irregular and the patient was somewhat fatigued. More rest was prescribed and the patient slowly regained his strength, his appetite and his courage. The catheter in this patient was not removed, although the end of the penis had to be cleansed frequently and the adhesive strips were replaced when they became

loose. Forty-one days following the beginning of the decompression, this patient was operated on. We used nitrous oxide and local infiltration anesthesia. The prostate was enucleated without trouble. A Pilcher bag was used to control the hemorrhage.

Before operation, his physical condition was again checked by the internist, who found the heart muscle and blood pressure in good condition. Following operation, the intake and output were carefully watched and there never was evidence of kidney insufficiency. The patient's post-operative course was uneventful and there was practically no bleeding. The wound healed so that the patient left the hospital on the twenty-seventh day. This case illustrates the danger of waiting until kidney damage has occurred before advising operation. This patient had just enough kidney tissue to withstand pre-operative treatment and operation. The reaction which occurred following the introduction of the catheter worried us a great deal and we were fearful that we were going to lose the patient.

Case No. 3.—A. T. S. Age 68.

Was first seen May 1, 1922, complaining of urinary incontinence, difficulty of urination and hemorrhoids. This patient's previous history as far as illnesses were concerned, was practically negative. Denied venereal infection. Father of three children. This man had been complaining for the last year and a half of frequent and difficult urination. He had some dribbling after passing his urine, and at times the trouble in starting was very severe. He developed hemorrhoids, which were operated elsewhere. Upon two occasions he had retention, so that a catheter had to be used to drain the bladder. His frequency became so great that he developed incontinence at night. The patient is a man who has worked very hard all of his life, although he has not been an alcoholic and has not otherwise abused himself.

Physical Examination.—Showed blood pressure of 198/96. There were many and varied senile changes. The heart tones were distant and of poor quality. There were some extrasystoles. This man had an arteriosclerosis of three on a scale of four. The prostate was enlarged, but was not nodular when felt per rectum. There was a small, hard nodule in the tail of the left epididymis. *X*-ray examination of the kidneys, ureters and bladder was negative. Cystoscopy revealed an enlarged prostate two on a scale of four. The bladder was very much trabeculated and there were a number of diverticuli. As the patient had been using a catheter very freely himself, we were unable to estimate the total amount of residual.

Diagnosis.—Chronic hypertension; cardiac hypertrophy; relative mitral insufficiency, a generalized, advanced atherosclerosis and hypertrophy of the prostate.

The blood chemistry at the first examination showed urea nitrogen 10.5 and the creatinin 3.2. P. S. P. test in two hours was 17 per cent. Because of this man's senile changes and the poor condition of his heart, we advised suprapubic stab drain, which would thoroughly drain the bladder and relieve the infection, after which operation might be considered. We advised suprapubic cystotomy in this case rather than a permanent catheter because we were sure that a very long pre-operative treatment would be necessary and did not feel that the patient could care for himself if he had a permanent urethral catheter. The patient refused operation at first, so that for one month he catheterized himself when he was unable to pass his urine. At the end of this time a suprapubic stab drain was done. This patient's improvement was very slow, as is evidenced by the reports of the blood chemistry and P. S. P. which are appended:

Urea nitrogen	10.5	mgm.
Creatinin	2.30	mgm.
P. S. P.	17%	
Urea nitrogen	33.75	mgm.
Creatinin	5.30	mgm.
P. S. P.	20%	
Urea nitrogen	19.5	mgm.
Creatinin	3.60	mgm.
P. S. P.	25%	
Urea nitrogen	24.5	mgm.
Creatinin	6.75	mgm.
P. S. P.	18%	
Urea nitrogen	42	mgm.
Creatinin	6+	mgm.
P. S. P.	21%	
Urea nitrogen	13.00	mgm.
Creatinin	1.20	mgm.
P. S. P.	20%	

This patient's general condition improved so that he was able to work around his house without edema of his legs and without other discomfort. He was able to eat and sleep well and gained in weight. Five months after beginning his pre-operative treatment, a check-up of his physical condition, together with his blood studies, indicated that this man was a fit subject for prostatectomy.

Under gas-ether anesthesia, the suprapubic opening was enlarged and a digital enucleation of the prostate was done. In spite of this old gentleman's very poor condition, his post-operative convalescence was good. From our experience, we find that when patients are thoroughly prepared, the operation and the convalescence from operation are usually uneventful. They are not troublesome when compared to the stormy times that we sometimes have when attempting to decompress the bladder and the kidneys. The suprapubic opening in this case was slow to heal permanently, so that the patient remained in the hospital until we could discharge him with healed suprapubic opening and without a catheter. This occurred on the forty-seventh day. This man has been seen many times since the operation and his physical condition has remained exceptionally good. He still has some frequency of urination and a slight amount of residual urine, which is to be expected when one remembers the large trabeculated bladder which he had when operated upon.

Case No. 4.—C. O'C. Age 76.

Family History.—Negative.

Past History.—Negative. Denies venereal infection.

Present Complaint.—Frequency of urination for eighteen years. One week before examination he had acute retention of urine and had to be catheterized. He said that he had passed gravel at times and that blood was noticed when a catheter was used.

Physical Examination.—Revealed a cachectic, senile individual with a blood pressure of 140/90. The patient had a left inguinal hernia with some enlargement of the in-

guinal glands. There was some senile emphysema. The heart was not enlarged, but there was sclerosis of the aorta. The internist made the following diagnosis: Pyorrhea; general arterial sclerosis; left inguinal hernia and hypertrophy of the prostate.

This patient was immediately referred to the hospital for pre-operative treatment. The first blood chemistry revealed a creatinin of .55 mgm. per 100 c.c. and an urea nitrogen of 11.5 mgm. A permanent urethral catheter was put into place and the patient was given quantities of water—average 6,000 c.c. in twenty-four hours. After three days the patient got out of bed without permission, so that the decompression could not be continued as desired. At this time, the urea nitrogen had increased to 30.5 with creatinin 1.2. The patient was allowed to walk around the hospital with a permanent catheter, which completely drained the bladder. His P. S. P. tests were repeatedly low and never higher than 40 per cent. The patient's general condition improved very rapidly under pre-operative treatment, so that twenty-eight days following, his condition had improved, so that he was eating and sleeping well and had no complaint. The blood chemistry remained good and the P. S. P. had not decreased.

This patient was operated upon by sacral-block and local infiltration. The Pilcher bag was used, but was removed on the second day. A catheter was put into the bladder through the urethra. The suprapubic wound was healed on the tenth day. The wound opened again on the thirteenth day, after which it healed and stayed healed. This man was very arteriosclerotic and had a very long history, although he did not have the usual large amount of residual urine. It is probable that some of his prostate complaint was due to arteriosclerosis. At the present time the patient has to urinate two or three times at night, although he has no residual urine and still has a slight amount of pus in the urine. This man had symptoms over a long period of time so that his bladder was greatly distended and lost its tone. His kidneys and his bladder were infected so that he will probably always have some urinary frequency. His general condition has improved so that he is able to do hard work.

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DISCUSSION

Dr. H. C. Bumpus (Rochester): I want first to compliment Dr. Thomas on his very clear and thorough paper on this subject. There isn't much that can be added, but I think there are a few points which can be improved by emphasis.

First, the important facts relative to prognosis that may be gained from a general examination. For several years we have made routine electrocardiograms in all prostatic cases and so discovered unsuspected cardiac lesions that absolutely contra-indicated surgery in a number of patients, and in others the life expectancy is evidently so brief as to hardly warrant surgery.

Second, we do not feel that a routine cystoscopic examination is indicated in all patients with prostatic hypertrophy. If routine roentgenograms of the urinary tract are made the presence of calculi will be ascertained and a routine cystogram will demonstrate any unsuspected diverticulum. Therefore we reserve cystoscopy for those patients in whom the size of the gland examined through the rectum is not sufficient to explain the symptoms.

Third, this procedure has enabled us to discover many cases of early tabes when the bladder symptoms were the first evidence of the disease, but more important is the greater number of patients with various types of so-called cord bladder. Neurologic examination in these cases will frequently be negative, yet the nervous mechanism of micturition has undergone unmistakable pathologic changes, and surgery for its relief will only end in disappointment.

Fourth, this thorough urologic examination also reveals the prostate that is enlarged as a result of chronic infection, rather than adenomatous changes. The surgical removal of such glands is frequently followed by the lighting up of the old infection, which quickly involves the vesicals and aggravates the symptoms rather than lessening them. Such cases are better handled by the punch operation which removes only the obstructing portion.

Dr. Edward Bratrud (Warren): Dr. Thomas has given us a very clear, logical and concise outline of principles essential to success in surgery of the prostate. This is very gratifying as heretofore the discussion of prostatic surgery has revolved chiefly around operative technique and the choice of two operative routes. The importance of this is evidenced by the fact that deaths in these cases mostly follow the preliminary operation and are usually due to poor preliminary preparation of the patient.

I wish only to emphasize a few of the points so ably brought out by Dr. Thomas:

1. Stress on examination, in ruling out tabetic bladder, diverticulum and medical diseases.

2. Given prostatic obstruction from whatever cause: adenoma, carcinoma, acute inflammation, median bar or contracture of the vesical neck, we get the same typical group of symptoms in each and the preoperative treatment that Dr. Thomas brought out is essentially the same.

3. Patients often get a tremendous relief of symptoms by removal of a small bit of the obstructive tissue, in selected cases, but the pre-operative treatment is essentially the same.

4. In our clinic at Warren, we attach considerable importance to the specific gravity of the twenty-four hour specimen from day to day.

5. We have quite a number of cases of prostatic obstruction coming in with acute retention, with the bladder almost to the umbilicus and having frequently suffered considerable trauma to the urethra in an attempt at catheterization. Our practice in these cases is to insert a 3.5 inch, 22 caliber needle into the bladder, going through the skin horizontally so as not to cause pressure on the bladder, and then allowing the bladder to empty

itself drop by drop. The needle can be reinserted frequently and the patients seem to react very nicely. In three or four days we can usually insert a urethral catheter.

Some of these cases have been previously catheterized with complete emptying of the chronically distended bladder and we get them in shock, with bloody urine and impending uremia, and considerable infection in the posterior urethra, and the greater number rapidly pass out.

DR. W. F. BRAASCH (Rochester): The admirable paper presented by Dr. Thomas has brought to our attention the more modern methods of preliminary treatment for prostatectomy. This consists largely of two factors, namely, the increase in our knowledge of renal functional tests, and the realization of the great value of preliminary drainage. In the days when we did not have the present functional tests, we used such good old-fashioned methods as the patient's general appearance, his general feeling and his appetite, and they still remain excellent factors in estimating the patient's renal function.

Unfortunately, however, a good many patients will feel and appear well and have a good appetite even when their kidneys are badly damaged. It is in this group, possibly 10 or 15 per cent of the cases, that the renal functional tests are absolutely necessary in order to discover the degree of renal obstruction. We have found that retention tests, such as the estimation of blood urea, is of more value than excretory tests, such as the phenolsulphonephthalein test. The possibilities of retention and technical error are so great with the phenolsulphonephthalein test that one cannot routinely rely on its accuracy, whereas it is comparatively easy to get an accurate estimate of the renal function with the present simplified methods of estimating the blood urea or creatinin.

As Dr. Thomas has said, a part of the reduction in mortality accompanying prostatectomy has been accomplished by transferring it to preliminary drainage. It is not generally realized how dangerous a procedure preliminary drainage may be. A few years ago mortality resulting from preliminary drainage was higher than that following prostatectomy. However, realizing the value of gradual decompression and the other methods of treatment mentioned by Dr. Thomas, we have greatly reduced the mortality resulting from preliminary drainage. Nevertheless, unless all precautions are taken, pre-operative drainage remains a dangerous procedure. If anyone believes that the introduction of a permanent catheter in a bladder which has retained a large amount of urine for a long time is a simple procedure, he will find from experience that it is not. He will find that it, rather than the operation of prostatectomy, often constitutes the danger period. If, however, drainage is carefully carried out with all the accessories of hospital treatment, such danger will be greatly reduced. If renal functional tests are also used, particularly the blood urea test, the mortality rate for prostatectomy should be reduced to well under 5 per cent.

DR. THEODORE SWEETSER (Minneapolis): There are just a few points that I want to bring out from my experience at the Minneapolis General Hospital and at St. Mary's Hospital in Minneapolis. I would not like to say that these are necessarily Dr. Owre's views, but some of them would meet with his approval, since I have been working under him. The reviews that we have at St. Mary's Hospital and the clinical pathological conferences that we have there every week have helped a great deal in bringing out the importance of the pre-operative treatment and study of these prostatic cases and in showing that really the pre-operative treatment and study have been more important, if anything, than the operative technic, and that if the pre-operative study is carried out carefully the patients get along very well. Since making a review about two years ago at St. Mary's on these prostatic cases I have noticed that there have been practically no cases that have been taken into the hospital and operated on very soon after their entrance. There has been plenty of time taken for the pre-operative study.

In the examination of the urine, I remember in looking up this review I found one case that entered the hospital some years ago and the patient had diabetes and died afterwards without a very careful study. I wanted to bring out that these diabetics can undergo prostatectomy if sufficient time and care are given beforehand. We have had two cases that went through very nicely and are still living and comfortable.

In regard to the blood functional tests, I believe that the blood tests are the most important, and I would like to ask the essayist about the importance of creatinin and the urea, the proportionate importance. I have felt personally that the creatinin content of the blood was the most accurate. We had one patient in whom on the diet the urea content came down within twenty-four hours or so, and the creatinin turned out to be the more accurate index.

THE DANISH GOLD TREATMENT OF TUBERCULOSIS

Hardly a year passes but that the announcement is made of some new method of treating tuberculosis. The most recent method to receive sensational publicity duly accorded any venture in the treatment of tuberculosis is a preparation of gold advanced in Denmark under the name "Sanocrysin." At a meeting of physicians in Denmark, Professor Moellgaard, the originator of the remedy, described its production and its effects. Other physicians gave an account of their results with the treatment. Several deaths from the remedy were reported. It is stated that Professor Moellgaard was the most cautious of all who spoke. *(Journal A. M. A., Dec. 13, 1924, p. 1928.)*

KAFFEE HAG

Kaffee Hag was found to contain 0.03 per cent of caffein and 11.47 per cent of caffetannic acid, which agreed with the claim made for it, that 95 per cent of the caffein was removed. A later analysis showed Kaffee Hag to contain a somewhat larger amount of caffein, namely 0.12 per cent. A still more recent examination showed the presence of 0.09 per cent caffein. Assuming that the average coffee contains 1.25 per cent caffein, the amount of caffein remaining in Kaffee Hag should be close to 0.06 per cent to agree with the claim that 95 per cent of the caffein is removed. *(Jour. A. M. A., Jan. 24, 1925, p. 306.)*

TRACING INFECTIONS IN A SURGICAL SERVICE*

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A great many standardized hospitals today have a "hospital analysis sheet" compiled every month and read at meetings of the staff for information of its members. In this "hospital analysis" there is a clause dealing with the number of infections occurring in surgical service during the month. During the past winter, at one time, the hospital analysis at St. Luke's showed a considerable increase of infections and an inquiry was made into the cause of these infections. Co-operation among the surgeons is a great help in such an inquiry. Some of these reported infections occurred in operations most carefully performed. Cultures repeatedly taken from wounds healing apparently very well, but showing a pearly bleb at one point in the wound, invariably yielded a bacterial growth from the serum and this was usually staphylococcus. Wound infections complicate and prolong convalescence and every effort should be made to eliminate them.

Investigation of this problem involved a search touching upon the operation of the sterilizer, the condition of the draping material, gowns, towels, lap sheets, wash cloths, sponges, and other materials, as well as rubber goods coming in contact with the operation, such as rubber wicks, drains and gloves. It also involved the method of handling instruments and the preparation of the hands and the patient's skin.

A short period of observation in the operating room disclosed a few loop-holes and these were jotted down.

Carelessness on the part of an operator is occasionally responsible for some infections. In spite of the most scrupulous care on the part of the operating room staff and rules concerning the preparation of materials, these safeguards will be entirely offset by a drop of perspiration running off the tip of the nose or from the forehead onto the sterilized linen. These, of course, are only preventable by the individual surgeon and attention is called here to this fact so that those who run may read.

The sterilizer was first investigated. Cultures were made from the centers of large packages and from the centers of small packages. The results showed positive cultures from the centers of large packages, but from the centers of small packages the cultures were persistently negative. Hence, the sterilizer was taken down and an investigation of the circulation made. In the overhauling process it was found that one of the pipes was plugged and that the steam circulation was poor. This was remedied and cultures again taken after sterilization were all negative successively. Cultures were made of all rubber wick and drain material and these were negative. The gloves were not cultured but the glass indicators placed with the gloves in the autoclave were persistently negative and the gloves were regarded as sterile.

It was then undertaken to ascertain some of the other methods by which an infection might creep into an otherwise sterile operative case. On one occasion an operator frequently coughed into his mask in the direction of the wound while he was working. It was suggested that this matter be investigated as to the possible cause of infection here. Therefore, a thick mask was placed over the mouth and the experimenter coughed through it over a culture plate several times and the plate was then placed in an incubator. Also the same individual breathed several times from the uncovered nostrils over the surface of a culture plate and this was placed in an incubator also. As one might well expect, both of these cultures were positive and gave rich growths of bacterial colonies.

It was next undertaken to discover whether the method of sterilizing the hands before putting on the dry gloves was efficient and the following method was resorted to. Cultures after scrubbing were made in several instances from the ungloved hands, under nails and cuticle, of both operator and nurses. The results will be seen as tabulated in Table I.

It was also noted on several occasions that when the gloves were removed from the hands of the surgeon one or more bloody fingers would be shown underneath the glove indicating a punctured glove at that point. These stained fingers also were cultured to see what could be grown from

*Presented before the annual meeting of the Minnesota State Medical Association, St. Cloud, October, 1924.

them. Results of this experiment also will be found in Table I.

In order to focus the searchlight of suspicion upon the particular offending fingers an attempt was made to ascertain the greatest number of punctures per finger. Therefore, a chart was drawn and placed in the work-room where the gloves are repaired. Each time a puncture was found, a mark was made by the nurse, opposite the finger on the chart, showing on which finger the puncture was found. This record was kept for a month or more and the figures were then combined and tabulated.

thirty punctures or tears would average only one puncture to three nurses. This, however, is as it should be for there is very little excuse for puncture of the nurse's glove. The surgeon's gloves, however, are exposed to the danger of wounding throughout an operation.

The contents of this paper do not, by any means, represent all the dangers threatening asepsis. Placing of sterile gloves under the arms, the handling of any unsterile object with a single sterile towel, or operating on an unsterile table top covered with sterile towels which have become soaked through is to be condemned from an aseptic viewpoint.

TABLE I

Name	Med.	Cuticle	Nail	Nose	Forehead	Cough	Nasal Breath	Punct. Finger
Dr. A	Agar	— Before Op.	— Before Op.	+ Post-op.		+ Plate	+ Plate	
Dr. B		—	— Before Op.	+ Broth		+ Plate	+ Plate	
Dr. C		— Before Op.	— Before Op.					
Dr. D		— Broth	+ Post-op.					
Dr. A			— Post-op.					+ Post-op.
Nurse X			+ Broth					
Nurse X			+ Post Scrub					
Nurse Y	Broth		+ Broth	— Agar	+ Agar			

Controls All Negative

The results, as may be seen from Table II, disclose that the index finger of the glove is most often punctured, the middle finger coming next. The ring and little fingers are in least danger. The right gloves show more punctures than the left.

Assuming that the seven, seven and one-half and eight sizes were worn by the sixty-five surgeons, and the total punctures or tears in this group seventy; then the number of punctures per operator would be 1.7.

Assuming that all the six and one-half size were worn by the eighty nurses, one may see that the

CONCLUSIONS

1. Thumb, index and middle fingers, especially of the right hand, should be most carefully scrubbed and possibly dipped in a strong antiseptic solution and allowed to dry before gloves are put on. Tincture of iodine or Harrington's solution, or Thymol (5%) in alcohol (60%) have been suggested for this purpose.

2. A punctured or torn glove should be changed at once.

3. More instrumental skill should be cultivated in order to prevent wounding of gloves.

4. The surgeon or nurse should never proceed with wounded gloves. The gloves should be scrutinized carefully for punctures two or three times during operation.

5. Nurses should be very careful in handling instruments not to puncture or tear the gloves. At the stock table they should handle instruments only with sterile forceps. At the operating table nurses should not touch instruments with the gloved hand except when absolutely necessary.

TABLE II
GLOVE SIZES

Digit					
Left	6½	7	7½	8	Total
Little	2	1	0	0	3
Ring	1	1	2	3	7
Middle	3	3	6	0	12
Index	3	4	5	5	17
Thumb	4	0	7	0	11
Right					
Thumb	3	0	8	2	13
Index	8	3	13	1	25
Middle	4	3	4	1	12
Ring	2	0	2	0	4
Little	0	1	0	1	2
	30	16	47	13	

76

Total number of surgeons operating—65.
Total number of nurses assisting—80.

DISCUSSION

DR. THEODORE SWEETSER (Minneapolis): There is just one little point that I want to bring out. About a year and a half ago at St. Mary's Hospital in Minneapolis we had an increase in infections on the surgical service but there were no serious infections. We tried to look up the cause and after eliminating practically everything else we studied the alcohol that the surgeons were using for soaking their hands in after they had scrubbed. Of course we know that hands that are scrubbed with soap and water are not necessarily completely sterile. In studying this alcohol we found that as many as four or five, that is the nurses and all the surgeons connected with the case, had been using the same dish of alcohol. We studied the specific gravity of the alcohol and found that after the last one had used the alcohol the strength had dropped down from the 70 per cent which we considered the correct per cent to 30 or 40 per cent or in some cases even less. We used more dishes of alcohol among those taking part in the operation and tested it very frequently for specific gravity, and the number of infections dropped very promptly after that.

DR. A. N. COLLINS (Duluth): I am very grateful for the discussion. I do not think it makes much difference what the type of the growth is. We do not want infection at all, we want a clean wound. That is the ideal to be striven for. If we get infections there is something wrong somewhere. If we are going to standardize hospitals we might also begin standardizing our results from a wound healing standpoint. Streptococcus, to be sure, may not be a very fatal type of infection provided it gets into the right individual, but it may prolong the stay of the patient in the hospital.

The alcohol bath, which I consider the best type of antiseptic to be used on the hands after scrubbing, as one member has just suggested to us, is one of the variable factors which we should not neglect. I know that alcohol which is used daily is often taken after the morning's work including water drippings from the hands, filtered through some cotton, placed in a bottle and put back for use the next day. I venture to say if it were tested occasionally we would find that we have mighty little alcohol in it. There has been a great deal of speculation as to whether 75 or 80 or 90 percentages of alcohol are as efficient as the lower ones in sterilizing the hands. I am not prepared to answer this. I am inclined to use a medium percentage rather than a higher on account of the evaporation.

Of course we might have drawn several conclusions from our paper. However, it is not necessary to state the self-evident conclusion that it is unsafe to cough through the mask in the direction of the wound or to breathe through the nostrils continuously in the direction of the wound. It is done all the time and we might just as well confess it.

There are some other things we are trying to do. For instance, it has been suggested that the moment we make an incision, even though the skin is all sterilized and plastered over with two or three coats of iodin, that when that incision is first made you loose into the wound certain bacteria that are in underlying layers and are squeezed out from the sides. The pressure of the knife in addition to the cutting releases the bacteria. Our custom is to throw aside the knife used for the skin incision and use a fresh knife deeper down. We are beginning now a series of cultures on wounds immediately after incision.

CLEERO

This is labeled "the vanishing shampoo." It is another piece of cosmetic quackery put out by the Van Ess Laboratories, Chicago. Cleero is sold with the claim that the use of soap on the hair is dangerous and that "the free alkali present in most soaps" makes them still worse. The A. M. A. Chemical Laboratory analyzed Cleero and found it to be essentially a perfumed watery solution of soap with free alkali and glycerin. *(Journal A. M. A., Nov. 15, 1924, p. 1607.)*

SOMNOS

Somnos is marketed by the H. K. Mulford Co. It was investigated by the Council on Pharmacy and Chemistry in 1906. The committee that made the investigation was unable to find that Somnos was less toxic than hydrated chloral or that it had a less depressing effect on temperature, respiration or circulation. On the contrary, the psysiological effects were indistinguishable from hydrated chloral. *(Jour. A. M. A., Jan. 10, 1925, p. 136.)*

THE REPORT OF A COMMITTEE TO INVESTIGATE THE CULTS

More than a year ago a committee of the Massachusetts Medical Society prepared and presented a comprehensive report in which the advisability of a careful and exhaustive investigation of the methods of the cults was suggested. The committee was continued and has undertaken some investigations. Its final report, made to the Councilors of the Massachusetts Medical Society, appeared in the *Boston Medical and Surgical Journal*, Oct. 25, 1923. The committee attempted (1) to learn what is the underlying pathology of lame backs and why they are in some instances benefited by osteopathic treatment; (2) to find out if there is any value in osteopathic treatment in well understood diseases; (3) to ascertain if the so-called osteopathic lesion along the spine is a constant and specific one for different diseases of known pathology.

The first undertaking was abandoned, after an attempt to have some investigations made jointly by the orthopedic department of the Massachusetts General Hospital and some osteopaths. So the committee had nothing to report on that.

To determine any possible value in osteopathic treatment in well understood diseases, treatment by osteopathic manipulations was started in the wards of the Peter Brent Brigham Hospital, but the patients so treated did not stay in the wards long enough for the treatments to be satisfactory from the point of view of the osteopaths, and so that form of investigation was abandoned. Finally, however, an osteopath worked on a group of eight cases of "so-called" asthmatic bronchitis, and gave them a satisfactory number of treatments. In reply to letters sent them, four of the eight patients have stated that they have felt improved since they had the osteopathic treatments. The committee regrets "that further work could not have been done under carefully controlled circumstances on cases in which the degree of improvement could be measured by some more exact standards than the personal feelings of the patients and in diseases in which the course of events is a little less variable. Such an investigation, however, did not seem to be practical with the force available."

The failure to secure results in the first two undertakings was not so marked in the third, because developments of interest to the committee ensued. Two members of the staff of the Peter Brent Brigham Hospital and three osteopaths conducted this study, which was made to ascertain if the so-called osteopathic lesion along the spine is a constant and specific one for different diseases of known pathology. The two staff physicians "endeavored to learn" from the osteopaths how to detect the presence of the "osteopathic lesion." A series of cases were then studied for the "lesion," with two or more of the group of workers examining independently each patient. The diagnosis was not known at the time of the examinations. About 180 cases were studied in this manner, including diabetes mellitus, cardiac disorders, respiratory tract infections, gastric lesions, chorea, pernicious anemia, hypertension, psychoneurosis, and a few cases later diagnosed as "no disease." "One or more so-called osteopathic lesions were detected at various points along the spine in each case," says the report, "but there was no specificity of location of the lesion for a given disease." In a considerable group of the cases examined, the two osteopaths, working independently, agreed on the location of the lesion in only 12.5 per cent of the cases. The committee concludes, therefore, that the study "seems to show not only that the osteopathic lesion is a difficult one to detect even by experienced osteopaths, but also that there is no specific lesion along the spine for a given disease."

The Massachusetts committee "feels that considerable doubt must be thrown upon the theory of osteopathy" and that "although osteopathic procedures seem to have some value as a therapeutic agent in certain *conditions* it has not been made clear how this benefit is derived; and, further, that the existence of osteopathy and chiropractic, "although based upon false theories, probably in part flourish from the failure of the medical profession to give due importance to physiotherapy." The committee "urges that the medical profession and the medical schools of the country pay more attention to this form of therapy," and asks to be discharged.

One who has known of the work of the Massachusetts committee can but have been impressed with the earnestness with which they went about the investigation they were appointed to undertake, but one wonders if anything more than has been reported could possibly have come from such an investigation. The wooden handle cannot be welded to the pewter spoon; no more can trained physicians satisfy the viewpoint of the cultist with whom they may be called to work in such investigation, nor can the cultist, if he believes what he preaches, satisfy the viewpoint of the trained physician. When it's all done, one is reminded of the story of the hard-working negro woman who went to the county fair with her worthless spouse. Soon after their arrival at the fair grounds, the aforesaid worthless spouse persuaded his better half to entrust him with a dollar and then promptly disappeared from her sight. After a long search she located him astride a wildly rocking horse on the flying jenny, otherwise known as the merry-go-round. She waited his descent therefrom and demanded to know what had been done with the dollar, only to be told that he had spent it riding on the flying jenny. "Uh huh!" she exclaimed, "you done ride up a whole dollar an' whar you been?"—A. M. A. Bulletin, Nov., 1923.

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EDITORIAL

Changing Views As To the Cause of Diseases of the Mind

If diseases of the mind still remain more or less a field of mystery and of misunderstanding, it is certainly not due to any lack of age, for the conception of disease of the mind was recognized in the earliest period of which there is any record and one sees reference to it, for example, in Saul's recurring periods of depression and in Ulysses' simulation of insanity to avoid service in the Trojan war. In all these early days, the insane were looked upon as possessed by spirits, and usually evil spirits. In the later Greek and Roman civilization, there was some advance in treatment, and drugs, baths and exercises were employed. Hippocrates (about 460 B. C.) even taught that the brain was the organ of the mind and that insanity must, therefore, be the result of some disturbance in the brain, the essential of our modern physiologic conception of insanity. But, in the second and third centuries of the Christian era, and all through the middle ages, there was a marked regression. All thought of the physiologic conception was lost sight of and theories of demoniac possession, sorcery and witchcraft held sway over all the civilized world and it was only after many centuries that the insane man came to be looked upon as a sick man.

In the nineteenth century, with some impetus to the study of anatomy and physiology of the brain, the physiologic conception became well established. If Gall were living today, we should certainly call him a quack, though he is undoubtedly the father of the view that the brain cortex is the particular organ of psychic activity and that the different parts of the cortex do not constitute a uniform structure, either anatomically or functionally.

Though for many years the physiologic conception has held unquestioned sway in the medical world, its position has recently been contested by what is called the psychologic conception. This conception assumes that mental processes can be studied without any reference to anatomical changes, which may or may not accompany them in the brain. The study is from the standpoint of psychology and the various abnormal phenomena are looked upon as merely states of mind. Though the physiologic conception has been held by practically all the medical world for many years, it is only fair to state that hopes founded on it have not been fully realized and this is probably one reason why the psychologic conception has recently shown such a lusty growth.

In the physiologic field, no one has proven a more zealous worker in recent years than Dr. Henry A. Cotton, of the Trenton, New Jersey, State Hospital. In repeated publications he has urged on the medical profession views in reference to the rôle of infection in the psychoses which are as radical as they are positive. Cotton deprecates the views on heredity, held by the ordinary medical

man, as destructive of all hopeful effort. He admits the importance of states of mind only insofar as they lessen the patient's resistance to infection and he believes the various emotional factors of importance only insofar as they exercise an unfavorable influence on the ductless glands. Such evil influence as is exercised by the ductless glands occurs largely through their infection and, in the limited number of cases in which he has failed to effect a cure, he attributes a certain proportion to those instances where infection of the ductless glands has not been removed.

Streptococci and colon bacilli are the most important organisms encountered and dental infections were the first ones subjected to elaborate study and treatment, but the field of operation has since been greatly widened and now includes the teeth, the tonsils, the gastro-intestinal tract, the cervix uteri and the seminal vesicles.

Even teeth only under suspicion are extracted, and impacted teeth are considered always infected and, therefore, proper objects for extraction. Infected tonsils are removed, irrespective of the age of the patient. Removal of the teeth and tonsils is followed by vaccine treatment and the use of anti-streptococcus and colon bacillus sera. If, with these treatments, the patient fails to recover, further investigation is made of the gastro-intestinal tract and, if found diseased, operation for removal of the infected portion of the colon is the next procedure. Attention is also given to the cervix uteri and the seminal vesicles.

With these methods of treatment, Cotton claims a rise in the recovery rate in his institution from 37 per cent to 80 per cent and he considers the increase of 43 per cent in recovery as due entirely to his method of removing infection.

Unfortunately, other workers along more or less similar lines have failed to reach equally satisfactory conclusions. Thus, Kopeloss and Cheney, at the New York State Psychiatric Institute, have failed to see any difference, whatever, in a group of patients from whom infected teeth and tonsils were removed as against another group in which no such procedures were undertaken. Naturally, Cotton charges that the work of these men was inadequate and, presumably, incompetent.

Naturally, only time will reveal what the effect of these treatments is to be. In the interval, one must bear in mind that the last generation was almost equally enthusiastic in removing every detachable organ from the female pelvis to relieve these psychic conditions. Whether the infection idea is merely another of the many fads and fancies which have misled the profession and the public so many times in the past, the future will determine. For the present, we may rest assured that Dr. Cotton and his associates are giving us the opportunity to see the results of the treatment which Cotton has proposed, carried out on a large scale, with much enthusiasm and great thoroughness.

A. S. H.

The Legislator and Medical Practice

During the past decade there have been marked strides in the improvement of medical education throughout the United States due largely to a responsive medical profession to the stimulation and criticism of our medical institutions by the investigations and report of the committee of the Carnegie Foundation for Advancement of Teaching, after a thorough study of the situation.

The state of Minnesota through the medical department of our university, supported by a progressive medical profession and the co-operation of the State Board of Medical Examiners, has at all times occupied the vanguard in elevating and maintaining the highest medical standards.

Recent legislatures have made repeated attempts at legislative enactments inimical to the medical profession. To thwart these efforts each session of the legislature must be carefully scrutinized with a view to recognizing promptly efforts at legislation aimed to lower the standards of medical practice. In most instances these attempts are made indirectly, there being no overt measures to lower the requirements demanded of regular practitioners in medicine, but rather the establishment of lower educational requirements for those desirous of legalizing various cults now existing but not universally recognized.

The medical profession desires to elevate the standards of members and not to lower the entrance requirements. It stresses the importance of protecting the public by requiring equally high preliminary education and scientific preparation to practice the art of healing for all those who would treat the sick irrespective of the system of therapeutics they openly declare. Whether we admit or deny that the rights of the regular practitioner are

infringed upon by opening wide the doors to ignorant, untrained and unqualified practitioners, the injury to the profession is far less than that which results to the body politic.

Our regular school of medicine has labored incessantly for the elevation and maintenance of its own standards, not merely in the interests of professional standing, but in accord with the belief that the sick of a community are justly entitled to the highest type of skilled service founded upon a cultural foundation and scientific training.

To sanction dual educational qualifications is incongruous and has no justification; it outrages public welfare, regardless of the "isms" and "pathies" of definite belief. Not taking the element of therapeutics into consideration, it is undeniable that capacity for making diagnosis is a fundamental in the training of those who would apply themselves intelligently to the care of the sick. Any system of licensure which fails to take cognizance of diagnostic ability falls short of adequate provision for safety.

The confidence in regular practitioners of the art of healing is evidenced the world over. The progress in lessening morbidity and mortality, the enrichment of human life, the result of the earnest endeavors of physicians in all branches of medicine are adequately recognized and heralded except in legislative halls when a lobbying group lifts up its voice for political recognition. Under this influence the legislator little thinks of the triumph over disease and its control; his mind does not dwell upon the accomplishments of our hospitals, dispensaries and medico-social agencies, nor the excellent achievements of our Department of Health. It would seem that public health dwindles in importance when it comes to satisfying the demands of an alleged constituent with vote-getting possibilities.

How and why legislators can open upon the general public the doors of the various cults that are completely out of harmony with intelligent conception of etiology and pathology of disease, denying the existence of germ-borne disease; that repudiate every vestige of the achievements of physical and chemical science; that reject every doctrine of causation, save in their own obscure and indefinite concept as exemplified by the numerous legal definitions of chiropractic, is hard to conceive. It is almost ridiculous to believe that legislators believe and accept these doctrines and are legislating because of their convictions that such methods will advance the public health.

What is the remedy? Medical lobbying to controvert the statements of those whose commercial interest seeks to dictate terms of licensure has been ineffective. However, the medical profession must not assume an air of armed neutrality. If our county societies and our state organization had the real courage of conviction, concerted action would make it impossible for such follies to be perpetrated by those legislators who are too weak to meet the lobbying tactics of any cultist group. Where are the large organizations who are constantly utilizing the services of physicians who consider themselves allies in fostering the welfare of the communities, such as our public health and various charitable organizations, unions and industrial institutions, life insurance companies, the lawyers who lean upon medical science for aid in arriving at the truth concerning accidents, compensation and the like? Of course, we can hardly criticize these allied interests when physicians themselves do not actually undertake an organized defense of the public interest. Physicians hesitate opposing legislation because it is such a simple matter to accuse them of self-interest.

Finally, the conscience of legislators must be aroused by publicity. They should be reminded that the respect for the health of a community is an obligation resting upon themselves equally with the physician; that they have responsibility as well as power, and should be guided and controlled by it. When voting for a proposed law that would lower the standards of medical practice, particularly for those who deny the existence of infection, the need of sanitation, etc., they should be compelled to give a reason for justifying their act. Instead of the medical profession being on the defensive in attacks upon our educational standards in this state, the legislator should have thrust upon himself the responsibility of defending his activities in behalf of those whose irregular principles antagonize human experience and established scientific judgment. The medical profession should openly challenge as a breach of good faith and political trust those legislators who through ignorance, bias or political ambition are willing to sacrifice the best interest of the constituents they have sworn to represent and protect.

G. B. W.

Medical Practice Bill

Progress has been made respecting Senate File No. 241 (known in the House as House File No. 294), which bill changes the Statute of Limitations so that malpractice suits must be brought within two years instead of six years as now.

This proposed act will limit the time within which such actions may be brought as against doctors, dentists, hospitals and sanatoriums. The present status of the bill would indicate that we have good reason to hope for its ultimate passage. The Judiciary Committee of the Senate has approved and recommended the bill. This is in itself a decided step in advance and a hopeful sign of ultimate success.

The proposed act, as amended in the Judiciary Committee of the Senate, permits the defendant to plead a counterclaim arising out of any negligence or malpractice out of which a cause of action might arise.

The proviso, or amendment, is in language as follows:

". . . provided, a counterclaim may be pleaded as a defense to any cause of action arising under subdivision one of this section notwithstanding it is barred by the provisions of this chapter, if it was the property of the party pleading it at the time it became barred and was not barred at the time the claim sued on originated, but no judgment thereon except for costs can be rendered in favor of the party so pleading it."

Our attorneys inform us that this proviso means that where a doctor sues a patient for services rendered, let us say for illustration in the sum of $200.00, the defendant would be, under this amendment, permitted to counterclaim for malpractice (or other negligence), but unless the counterclaim is brought within two years, the defendant would be limited in his recovery thereunder to an amount not exceeding the doctor's claim. It would appear that this feature of the bill is not of great importance. We usually find that if a doctor's bill is not paid within two years its value is so problematical as to leave it of very little, if any, value.

Mr. Oppenheimer, the association attorney, who has looked over the above amendment, states that it is not necessary to raise any serious objection to this amendment, as a man has an inherent right to make counterclaim anyway, and this right cannot be legislated away from him, therefore this amendment does not detract from the value of the bill and will not affect the constitutionality of the bill.

It is our hope that the bill will be promptly considered by the Senate and we confidently look for passage therein. Our difficulty with respect to the success of the act lies with the house. The Committee in the House may not be favorable to the proposed law. However, it is our intention to use our best efforts to bring about a favorable report. If we cannot do so, we at least hope to get a minority report, so that the merits of the bill may be fought out on the floor of the House.

The importance of this legislation is such that it behooves every member of the profession mentioned to work for its ultimate passage. Malpractice suits have increased more than 300 per cent within the last few years. Furthermore, larger verdicts are constantly appearing. A man's skill, ability, integrity and general reputation do not bar recovery in a malpractice suit. Not only the monetary cost to the doctor, but the mental worry, anxiety, loss of prestige, etc., far exceed the actual money loss. It is estimated that at least one-third of the suits brought for malpractice are begun after two years and the most of these are of the blackmailing or hold-up type, often being brought in where the doctor tries to collect a bill. At other times such actions are brought as late as within a day or two of the present six year period of limitations. The danger facing the profession under circumstances such as exist in the practice of every doctor and dentist (not overlooking or forgetting hospitals and sanatoriums) is very real. The proposed act should prove of inestimable value to the profession.

The present bill is the same that was presented to the Legislature four years ago and which was summarily killed in committee. The favorable course of the bill so far is due to the untiring efforts of our legislative committee and particularly its chairman, Dr. H. M. Johnson, of Dawson, who has been devoting all his time since January 10th to legislative affairs of the association.

The impression has been given elsewhere that passage of the bill in question is assured. This is an erroneous impression as the recommendation of the Judiciary Committee of the Senate was not announced until February 18th and at the present writing the Judiciary Committee of the House has not taken definite action. There should be no let-up in our efforts to bring to the attention of this House committee our ideas of the justice of the provisions

of this bill. Some members of the association have shown a lethargy when requested to co-operate with the legislative committee of the association. Prompt action in such matters is essential. The more the subject is investigated the more important the passage of this bill seems to be. As stated above, about one-third of the present malpractice suits are not instituted until after a two year period following the rendering of professional service. The present bill deserves the backing of every member of the association.

OBITUARY

DR. JOHN WILLIAMS

After several years' struggle against expected death from heart trouble, Dr. John Williams, of Lake Crystal, finally succumbed in Mankato, Friday afternoon, November 21, 1924. Dr. Williams was spending a few days visiting relatives in Mankato previous to his anticipated return to California, where he had gone for the past several years during the winter.

Dr. Williams was born at Machynlleth, Montgomery, North Wales, in 1856, being the son of the late Mr. and Mrs. Lewis Williams. His father was the relieving officer of the district and a very highly respected citizen of his home town. Dr. Williams began his medical studies when very young, under the well known Dr. Hugh Lloyd of Machynlleth, with whom he spent seven years.

In 1877 he came to America and located at Bangor, Wis. He took a course in Rush Medical college, Chicago, from which institution he graduated in 1880. August 25 of the same year he was married to Miss Sarah H. Hughes, the youngest daughter of the late Rev. John Hughes. Having practiced his profession at Bangor for four years, he moved to Cashton, Wis., and thence to Lake Crystal.

Two daughters were born to them, Una M., who died in 1891, and Edna A., who is married to Mr. Lee Piper of Minot, N. D.

Mrs. Piper is the only surviving member of the family, Mrs. Williams having preceded her husband in death on January 23, 1923. Mr. Williams also has surviving him a twin brother, D. D. Williams, residing in his native country of Wales.

A fitting tribute to Dr. Williams as a physician is taken from the columns of a home paper: "Dr. John Williams was a type of the old time physician who combined all the good characteristics of the older physicians with all the advanced skill of the later types. His presence in a sick room was an inspiration. His interest never ceased in patient and friend, and in hundreds of cases the satisfaction of healing the sick was his only desire for a reward. He enjoyed a large circle of acquaintance throughout this part of the state, including that of many eminent physicians and surgeons."

DR. GEORGE GOODRICH BALCOM

Dr. George G. Balcom, of Lake Wilson, died at his home Thursday, November 6, 1924, following a short illness.

Dr. Balcom was a pioneer physician in southern Minnesota. Born in Elmira, N. Y., on March 5, 1866. He spent his boyhood days in Grand Rapids, Michigan. After completing his high school course there he entered Hamline University and later the Medical College of the State University, from which he graduated in June, 1896, and located the same year in Avoca.

In 1897 he was united in marriage to Miss Rosa Levada Cornish, of Minneapolis. Dr. and Mrs. Balcom made their home in Slayton, where they resided until 1901. For twenty-three years Dr. Balcom and his family were residents of Lake Wilson, during which time the Doctor achieved a very extensive practice, winning his way into the hearts of thousands of people.

In his profession Doctor Balcom was held in great esteem. He was elected to places of honor and responsibility, being president of the State Homeopathic Society, vice president of Minnesota State Sanitary League, and until quite recently president of the Southern Minnesota Medical Society. He found extensive fields waiting for his accumulated knowledge and wide experience, consequently these organizations all prospered under his able leadership.

He leaves to mourn the loss of a loving husband and kind father, his bereaved wife and one daughter, Beatrice; his aged mother, who lives in Elmira, N. Y.; two brothers, Norman Balcom of South Bend, Washington, and Rutherford Balcom, of Detroit, Mich.; and one sister, Mrs. Lynn Woodberry, of St. John, Mich.

DR. JOHN ALEXANDER MONAHAN

John Alexander Monahan was born in New Brunswick, Canada, May 15, 1865. His father and mother came from Ireland and Scotland, respectively, and settled in New Brunswick, enduring the hardships of pioneer life there.

Dr. Monahan came to Minneapolis in 1887 and attended the College of Pharmacy of the University of Minnesota. After completing his course he studied medicine in Hamline University, from which he was graduated in 1902. After a year of internship in St. Joseph's Hospital, St. Paul, he took up the practice of medicine in Minneapolis, where he resided until his death. He was a member of the surgical staff of St. Barnabas' Hospital.

He was a member of the Hennepin County Medical Society, the State and American Medical Associations.

In 1891, Dr. Monahan was married to Miss Ella Jordan of Annandale, and there are two daughters, Ethel and Eva.

Dr. Monahan was a 32nd degree Mason and a Noble of Zurah Temple of the Mystic Shrine. He was also a member of the Benevolent and Protective Order of Elks, and of the Automobile Club of Minneapolis.

He died at his home in Minneapolis on Oct. 12, 1924, of heart disease.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

The annual meeting of the State Medical Association will be held at the University Medical School, Minneapolis, April 27, 28 and 29, 1925. Through the courtesy of the University authorities the use of the medical buildings has been offered to the Association.

The officers of the surgical section this year are Dr. Harry P. Ritchie, St. Paul, chairman, and Dr. O. J. Hagen, Moorhead, secretary. Those of the medical section are Dr. L. G. Rowntree, Rochester, chairman, and Dr. F. J. Hirschboeck, Duluth, secretary.

The Council of the Association will meet as usual on the morning of the first day (Monday) of the convention and the House of Delegates, the afternoon of the same day.

A tentative program for Monday evening has been arranged which will include addresses on subjects of practical value to members such as: Periodic Medical Examinations, Dr. Frank Billings; Medical Defense, Dr. W. C. Woodward, chairman of the Judiciary Committee of the American Medical Association; Don'ts for Malpractice, Mr. W. H. Oppenheimer.

Tuesday evening (April 28) is to be devoted to a banquet at which Dr. W. J. Mayo will preside as toastmaster. Dr. W. D. Haggard, Nashville, Tenn., president of the American Medical Association, will be the principal speaker and will address the members on "The American Medical Association and the Future of Medicine." Other invited guests are Dr. Frank Billings, Governor Theodore Christianson, President L. D. Coffman of the University of Minnesota and Mayor George E. Leach of Minneapolis.

On Wednesday evening a smoker and entertainment will be given the visiting physicians by the Hennepin County Medical Society and no efforts will be spared in making the evening most enjoyable.

The annual Minneapolis Clinic Week will be combined with the State Association meeting this year, and Thursday, April 30, will be devoted to clinics to be given by members of the Hennepin County Medical Society. Dr. W. A. Jones, Minneapolis, is chairman of the clinical section of the local society and will have charge of the clinics.

A tentative program of the scientific meetings follows:

TUESDAY MORNING, 8 o'Clock, April 28, 1925. Dr. Harry P. Ritchie, presiding.

Joint Session, Medical and Surgical Sections. The University Campus.

1. Clinic on Bone Tumors.
   (a) Clinical Presentation by Dr. H. W. Meyerding, Rochester, Minn.
   (b) Pathological Demonstration by Dr. W. C. MacCarty, Rochester, Minn.
2. Tumors of the Breast.
   (a) Clinical Demonstration, Dr. W. D. Haggard, Nashville, Tenn.
   (b) Pathological Demonstration, Dr. W. A. O'Brien, University of Minnesota, Minneapolis.
3. Tumors of the Lymph Glands.
   (a) Clinical Presentation, Medicine, Dr. S. Marx White, Minneapolis.
   (b) Surgical Demonstration, Dr. A. B. Colvin, St. Paul.
   (c) Roentgenologic and Radium Treatment, Dr. A. S. Fleming, Minneapolis.
   (d) Pathological Demonstration by Dr. E. T. Bell, University of Minnesota, Minneapolis.

WEDNESDAY MORNING, 8 o'Clock, April 29, 1925. Dr. L. G. Rowntree, presiding.

Joint Session, Medical and Surgical Sections. The University Campus.

1. Diseases of the Thyroid.
   (a) Clinical Demonstration, Dr. H. S. Plummer, Rochester, Minn.
   (b) Surgical Consideration, Dr. J. deJ. Pemberton, Rochester, Minn.
2. Diabetes Mellitus.
   (a) Clinical Demonstration, Dr. A. H. Beard, Minneapolis.
   (b) Surgery in the Diabetic, Dr. A. A. Law, Minneapolis.
3. Diseases of the Glands of Internal Secretion. Dr. H. L. Ulrich, Minneapolis.
4. Neurologic Clinic.
   (a) Nervous Disorders in Pernicious Anemia, Dr. A. S. Hamilton, Minneapolis.
   (b) Early Diagnosis of Tabes Dorsalis, Dr. J. C. McKinley, Minneapolis.
   (c) The Sequela of Encephalitis, Dr. E. M. Hammes, St. Paul.
   (d) Surgery in Spinal Cord Tumors, Dr. A. W. Adson, Rochester, Minn.
   (e) Clinic on Speech Defects, by Dr. Smiley Blanton, Minneapolis.

LITERARY PROGRAM

1. Phases of the Smallpox Epidemic; Lantern Slide Demonstration. Dr. S. E. Sweitzer, Minneapolis, Minnesota. Discussion, Dr. O. M. McDaniel, Minneapolis, Minnesota, and Dr. H. E. Michelsen, Minneapolis.
2. Causes of Death in the Fetus and Newborn; Based on 450 Necropsies. Dr. F. L. Adair, Minneapolis, Minnesota. Discussion, Dr. W. A. O'Brien, University of Minnesota.
3. Management of Toxemia Associated With Gastric Stasis, Obstructive and Non-obstructive, Dr. C. S. McVicar, Rochester, Minnesota. Discussion, Dr. Donald C. Balfour, Rochester, Minn.
4. Postoperative Pulmonary Complications, Dr. P. G. Boman, Duluth, Minensota. Discussion, Dr. F. J. Hirschboeck, Duluth, Minnesota.
5. Effect of Environment Upon the Upper Respiratory Tract and Clinical Significance, Dr. H. I. Lillie, Rochester, Minnesota.

6. The Use of Novasurol as a Diuretic, Dr. Harry Oerting, St. Paul, Minnesota.
7. Congenital Syphilis and Its Treatment, Dr. E. F. Robb, Minneapolis, Minnesota. Discussion, Dr. C. O. Kohlbry, Duluth, Minnesota.
8. Discussion of the Care and Treatment of the Psycho-Neurotic, Dr. W. A. Jones, Minneapolis, Minnesota. Discussion, Dr. Arthur Sweeney, St. Paul, Minnesota, and Dr. Frederick Moersch, Rochester, Minnesota.
9. Psychology of Compensation Neurosis, Dr. Arthur Sweeney, St. Paul, Minnesota.

THE AMERICAN CONGRESS ON INTERNAL MEDICINE

The Ninth Annual Clinical Session of the American Congress on Internal Medicine will be held in Washington, D. C., March 9-14, 1925.

Washington clinicians and investigators of attainment will devote the entire session to amphitheatre and group clinics, ward "rounds," laboratory conferences, lectures, demonstrations of special apparatus and methods, and the exhibition of unusual scientific collections. Civilian and governmental services are united in the aim to make the week useful and memorable.

Practitioners and laboratory workers interested in the progress of scientific, clinical and research medicine are invited to take advantage of the opportunities afforded by this session.

Inquiries should be addressed to the Secretary-General, Frank Smithies, 1002 North Dearborn Street, Chicago, Ill.

WABASHA COUNTY MEDICAL SOCIETY

Pursuant to instructions issued at the annual meeting of the Wabasha County Medical Society, held July 10, 1924, the following committee, Drs. H. E. Bowers, E. A. French and W. F. Wilson, interviewed the Board of County Commissioners at their first meeting in January and secured from them the following resolution:

"Resolved, that for the year 1925 no district physician shall be appointed, but in lieu thereof the following plan shall maintain: whenever anyone is in need of medical or surgical aid or attention and unable to furnish it himself, by reason of his poverty, any duly licensed physician and surgeon of the County of Wabasha may attend such individual, but before doing so, shall report the case to the County Commissioner of the district, and receive permission from the County Commissioner of that district. Each physician and surgeon shall present a bill with an itemized statement thereof duly sworn to the County Board monthly, and before the same shall be allowed it shall be approved by the commissioner of the district."

The committee asked the commissioners to pay regular rates for this county work, and it seemed to be the sense of the board to pay the fees according to the fee schedule of the County Medical Society. This new plan was approved essentially as formulated and is believed to be a great improvement over the former contract system.

OF GENERAL INTEREST

On November 5, 1924, a son, Antony Mills Diehl, was born to Dr. and Mrs. Harold S. Diehl of Minneapolis.

Dr. M. S. Nelson recently moved from Spring Grove to Granite Falls, Minnesota, where he has opened a hospital.

Dr. T. M. Joyce of Janesville has moved to the state of Washington, where he has taken up work in a Veterans Bureau Hospital.

Dr. F. J. von Bohland of Belle Plaine has been in California since the first of the year, where he went for the benefit of his health.

Dr. Robert Emmett Farr, Minneapolis, gave the McArthur Fellowship address before the Chicago Institute of Medicine, February 27th.

Dr. Ralph L. Kirsch, formerly of the Mayo Clinic, Rochester, is now associated in practice with Dr. J. B. Keaster, Lamanda Park, California.

"Pyelitis in Pregnancy" was the subject of a paper presented by Dr. F. J. Souba before the February meeting of the Fairview Hospital staff, Minneapolis.

Announcement is made of the marriage of Miss Josephine Kenyon, daughter of Dr. and Mrs. Paul Kenyon, to Philip Douglas Butturff at Wadena on Monday, February 2.

Dr. Gustav Schwyzer, Minneapolis, gave a demonstration of goiter cases before the noonday meeting of the Hennepin County Medical Society, Wednesday, February 11. Dr. Arnold Schwyzer, St. Paul, led the discussion.

Dr. Ann Whelan, Minneapolis, has recently been appointed temporary assistant in obstetrics and gynecology and Dr. Lyman R. Critchfield, St. Paul, assistant in pediatrics at the University of Minnesota Medical School.

At the annual meeting of the Waseca County Medical Society early in January the following officers were elected for the ensuing year: President, Dr. H. A. Miller; vice president, Dr. H. M. McIntire; secretary-treasurer, Dr. B. J. Gallagher.

At the regular February meeting of the staff of the Swedish Hospital, Minneapolis, Dr. Joseph Prim read a paper on "A Few Notations on Diabetes and Insulin." Dr. A. E. Johnson presented the subject "Surgical Complications of Diabetes."

Dr. Joseph D. Lewis, formerly surgeon in chief of the department of eye, ear, nose and throat diseases at the Minneapolis General Hospital, has announced the removal of his offices to Suite 421, San Marcos Building, Santa Barbara, California.

Dr. William P. Shepard, for three years assistant director of the Students' Health Service of the University of Minnesota, resigned his position on January 1 to become Commissioner of Health and Director of Hygiene of the schools of Berkeley, California.

In the list of honor graduates of the Army Medical School at the Graduation Exercises Tuesday, February 10, at Washington, D. C., is the name of First Lieut. Arthur D. Hawkins. Dr. Hawkins graduated from the University of Minnesota Medical School in 1919.

Dr. Russell M. Wilder, Rochester, Minn., gave the annual address before the Minnesota Pathological Society at their meeting Tuesday night, February 17, at the Institute

of Anatomy, University of Minnesota. His subject was "Studies in the Metabolism of Diabetes."

Dr. Harry D. Lees has been appointed assistant director of the Students' Health Service of the University of Minnesota. For ten years Dr. Lees was engaged in the practice of medicine at Esmond, N. D., and last year was resident physician at Parkview Hospital, Minneapolis.

The Council on Medical Education and Hospitals of the American Medical Association will hold its annual meeting March 9, 1925, in the Gold Room of the Congress Hotel in Chicago. Physicians interested are invited to attend.

It has been announced that the recently completed hospital at Eveleth, Minnesota, for the treatment of trachoma patients has been designated as the place to which all persons in Minnesota suffering from trachoma can be sent. The new hospital has been particularly equipped for the purpose.

In conformity with the recommendation of the House of Delegates of the State Association addresses by association members are being broadcast by Station WCCO each week. The addresses are being published in the country edition of the St. Paul Dispatch, which has a circulation of 280,000.

St. Mary's Hospital extended a very delightful staff dinner to its staff members and the medical profession on the evening of February 5, 1925. Eighty-eight doctors were in attendance at the dinner and remained for the staff meeting afterwards. Dr. F. W. Briggs read his staff thesis, and Dr. Gordon St. Clair gave a report on his recent studies on "Lues of the Central Nervous System."

At the December meeting of the Administrative Board of the Medical School, University of Minnesota, the following nominations were approved and recommended: Dr. Alexander Venables as Teaching Fellow in Ophthalmology; J. A. Evert, as Instructor in Physical Therapy; Dr. F. E. B. Foley as Instructor in Urology; Drs. V. P. Hauser and W. Ogden as Assistants in Surgery; Dr. J. F. Fulton as Emeritus Professor in Ophthalmology.

Dr. Kenneth H. Sutherland, who was a member of the staff of the Students' Health Service of the University during the year 1923-24, has been appointed county health officer of San Luis Obispo County, California. From July to December, 1924, he was engaged in public health work in the state of Alabama under the International Health Board of the Rockefeller Foundation. Before leaving to take up his work in California he was married to Miss Elizabeth Moody of Minneapolis.

The annual meeting of the Swedish Hospital Association will be held on Tuesday, March 3, 1925, at 8:00 P. M., in the Assembly Room of the hospital.

The President of the Board of Trustees and the Superintendent of the hospital will report on the work of the hospital for the year 1924.

Four trustees are to be elected for a term of three years. Those whose terms then expire are: Aaron Carlson, E. G. Dahl, Dr. Julius Johnson and John Nodell.

The new Wesley Hospital was opened in Wadena, January 30. This hospital is operated under the Board of Hospitals and Homes of the Methodist Episcopal Church. It is of brick, fireproof construction, modern in every respect with a present capacity of thirty-five beds. If occasion requires, the capacity can be increased to fifty beds. The hospital is open to all regular licensed physicians in the territory it serves. It is the intention to open a training school for nurses at the hospital in the near future.

Three Duluth physicians, Drs. R. S. Forbes, J. R. Manley and J. E. Power, will leave shortly, with their families, for from three to six months' special study in Europe. Dr. Power expects to devote his time to a study of eye, ear, nose and throat; Dr. Forbes to gynecology and obstetrics; Dr. Manley to gynecology and obstetrics. All of these men expect to follow the precedent set by many other Minnesota physicians, and intend to do their preliminary work in Vienna. The men interested in gynecology and obstetrics expect to visit Dublin.

The following resolution of the Minnesota State Medical Association adopted at the St. Cloud meeting last October was approved by the Administrative Board of the Medical School, University of Minnesota, January 12, and was referred to the Dean for consultation with the President:

"That the Secretary of the Minnesota State Medical Association transmit to the Board of Regents of the University of Minnesota the recommendation of their House of Delegates that in addition to educational requirements of the Medical School, the character of applicants for admission be ascertained by confidential reports and that those not measuring up to a proper standard be rejected."

The work of the Canadian Social Hygiene Council in conserving health and influencing longevity has received a high tribute recently. The Metropolitan Life Insurance Company of New York has made a grant of fifteen thousand dollars to aid in extending throughout Canada its child welfare and educational activities.

This company has long been famous for its generous support of such movements as may offer definite means of prolonging human life. It is today spending several millions annually in public health work in Canada and the United States. It has aided anti-tubercular work. It supports scientific programs of child welfare, and it is now stepping forward to fight against venereal diseases.

The Union Hospital, New Ulm, Minnesota, has recently effected an organization under the direction of the following officers: President, Dr. L. A. Frisch; vice president, Dr. O. C. Strickler; secretary, Dr. G. F. Reinecke; treasurer, Dr. George B. Weiser. The Executive Committee includes Dr. Theo. F. Hammermeister, Dr. J. H. Vogel and Dr. F. H. Dubbe. Dr. George F. Reinecke and Dr. A. L. Russke are in charge of the Eye, Ear, Nose and Throat department; Dr. Ross is the pathologist and bacteriologist. The superintendent, Miss Ida Stolt, has established a training school for nurses in connection with the hospital.

A gift of $250,000 to Indiana university by Mr. and Mrs. William H. Coleman, of Indianapolis, for a women's hospital to be used principally for lying-in patients, has been announced by officials of the university. The new hospital will be located on the medical school campus at Indianapolis and will become a training unit of the school of medicine. This new gift from Mr. and Mrs. Coleman is in addition to one of $75,000 contributed by them last June to the school of medicine of the state university for

the endowment of three chairs—ophthalmology under the direction of Dr. F. A. Morrison, surgery directed by Dr. John H. Oliver, and gynecology under Dr. O. G. Pfaff. The medical and hospital gifts are in the form of a memorial to Mrs. Suemma Coleman Atkins, daughter of Mr. and Mrs. Coleman.

The Friends of Medical Progress, a national lay organization incorporated in Boston, Massachusetts, in 1923, for the purpose of disseminating medical knowledge among the general public, is contemplating for the year 1925 a greatly extended program of service. Office headquarters, formerly located in Boston, have moved to New York City, 370 Seventh Avenue, where co-operation with the more important educational and health organizations will be facilitated. With the change in location also comes a change in name. The society will hereafter be called the American Association for Medical Progress. Mr. Benjamin C. Gruenberg, well known to workers in the fields of education and public health, will take over the active management of the organization. In the past year approximately 72,000 publications dealing with various phases of animal experimentation, vaccination, etc., have been distributed. An increasing number of similar publications is planned for the current year. A lecture program will be developed and attention will be focused on the formation of branch organizations throughout the country.

Ground has been officially broken and actual construction begun on New York's new Medical Center, which is being developed under the direction of the Joint Administrative Board of Columbia University and Presbyterian Hospital. At the exercises held Saturday, January 31, on the twenty-two acre plot at 168th Street and Broadway before a notable gathering of representative persons of the metropolitan district, including many of the profession, Mr. Edward S. Harkness, the first Chairman of the Joint Administrative Board, turned the initial spade of earth. This act signalled the starting of the construction of the first and largest unit of the Center, the combined new Columbia University School of Medicine and Presbyterian Hospital—a Ten Million Dollar structure. With the present units being built will be assembled a School of Nursing, a maternity hospital, a children's hospital, an eye hospital, an ear, nose and throat hospital, an orthopedic hospital, a urological unit, a dermatological hospital, a School of Dentistry, and such other institutions of patient care, teaching and research as are needed to fully complete the Center. Another important unit of this medical center will be a State Psychiatric Institute and hospital for the study of the prevention and care of mental diseases.

The new St. Luke's Hospital, Duluth, opened its doors to the public January 31, and to its patients February 2, 1925. This fine, modern hospital was begun in November, 1922, and now, when finished, has one hundred private room capacity, in addition to the old building, which is to be arranged with ward provision, space for interns, outpatients, etc. Schmidt, Gardner and Martin, Chicago architects, planned the structure, and German and Jenssen, of Duluth, were the local associates. On the opening of the hospital fully twenty thousand people went through and saw the numerous novel features, as well as the fine, substantial construction, on the two opening days.

St. Mary's Hospital, Duluth, has just opened up a splendid new suite of operating rooms, made over at a cost of approximately $37,000. These rooms include a splendid central sterilization room, in addition to special provision for the surgeons with lockers, shower baths and various other comforts. Each operating room is fitted with its own individual instrument sterilization equipment. Special provision is made in the corridors for instrument cases, storage, and easily available space for accommodating dressing packages and usual operating room equipment.

With these two fine, well equipped hospitals, Duluth now has well over five hundred hospital beds in its downtown area alone.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

BENZOL PRODUCTS CO.:
- Cinchophen-B.P.C.

HYNSON, WESTCOTT & DUNNING:
- Antimony Sodium Thioglycollate
- Antimony Thioglycollamide

ELI LILLY & CO.:
- Iletin (Insulin-Lilly) U-10, 10 c.c.
- Iletin (Insulin-Lilly) U-20, 10 c.c.
- Iletin (Insulin-Lilly) U-40, 10 c.c.

H. K. MULFORD CO.:
- Ampules Solution Pituitary Extract-Mulford, 0.5 c.c.
- Iodo-Casein with Chocolate

PARKE, DAVIS & CO.:
- Iron Citrate Green
  - Ampules Iron Citrate Green-P. D. & Co. ¼ grain
  - Ampules Iron Citrate Green-P. D. & Co. ¾ grain
  - Ampules Iron Citrate Green-P. D. & Co. 1½ grain
- Mercurettes
- Proposote
  - Proposote Capsules 5 minims
  - Proposote Capsules 10 minims

POWERS-WEIGHTMAN-ROSENGARTEN CO.:
- Tryparsamide

PURE GLUTEN FOOD CO.:
- Hoyt's Protein Cereal

SHARP & DOHME:
- Tincture Digitalis Purified (Fat Free)-S. and D.

STANDARD CHEMICAL CO.:
- Standard Radium Solution for Intravenous Injection, 5 micrograms Ra
- Standard Radium Solution for Intravenous Injection, 10 micrograms Ra
- Standard Radium Solution for Intravenous Injection, 25 micrograms Ra

Diphtheria Toxin Antitoxin Mixture 0.1 L + (Gilliland).—A diphtheria toxin antitoxin mixture (see New and Non-official Remedies, 1924, p. 299), each c.c. of which represents 0.1 L + dose of diphtheria toxin neutralized with the required amount of diphtheria antitoxin. Marketed in packages of three 1 c.c. ampules; in packages of thirty 1 c.c. ampules; in packages of three 1 c.c. syringes; and in ampules containing respectively 10 c.c., 20 c.c., and 30 c.c. Gilliland Laboratories, Ambler, Pa.

Mallinckrodt Tetrabromphenolphthalein Sodium Salt.—A brand of tetrabromphenolphthalein sodium-N. N. R. For a discussion of the properties, actions, uses and dosage, see Jour. A. M. A., Dec. 2, 1924, p. 2095. Mallinckrodt tetrabromphenolphthalein sodium salt is supplied in 5 gm. ampules. Mallinckrodt Chemical Works, St. Louis. (Jour. A. M. A., Jan. 3, 1925, p. 37.)

Bacillus Bulgaricus-Squibb.—A culture of Bacillus bulgaricus, marketed in tubes, each containing 12 c.c. Bacillus bulgaricus-Squibb, is designed for internal administration and for direct application to body cavities, abscesses and wounds. See "Lactic Acid-Producing Organisms and Preparations," New and Non-official Remedies, 1924, p. 169. E. R. Squibb and Sons, New York.

Neorobin.—A product obtained by the reduction of chrysarobin. The actions and uses of Neorobin are the same as those of chrysarobin. It is claimed that neorobin is somewhat more active than chrysarobin and that its staining qualities are less than those of chrysarobin. Like chrysarobin, neorobin is used in the treatment of skin diseases, especially in psoriasis. It is used in the form of ointments which must be freshly prepared. Neorobin is marketed in vacuum sealed tubes containing 1 and 5 grains, respectively. H. K. Mulford Co., Philadelphia.

Intracutaneous Tuberculin for the Mantoux Test.—A preparation of Tuberculin-Koch (New and Non-official Remedies, 1924, p. 309), marketed in packages of one vial containing 0.0001 gm. tuberculin "O. T." accompanied by a vial containing physiological solution of sodium chloride sufficient to make 1 c.c. Lederle Antitoxin Laboratories, New York. (Jour. A. M. A., Jan. 10, 1925, p. 119.)

Tablets Benzyl Fumarate-Abbott, 5 grains.—Each tablet contains 5 grains of benzyl fumarate-Abbott. The Abbott Laboratories, Chicago. (Jour. A. M. A., July 24, 1924, p. 41.)

Ampules Solution Pituitary Extract-Mulford, 0.5 c.c.—Each ampule contains 0.5 c.c. of pituitary solution-Mulford (New and Non-official Remedies, 1924, p. 229). H. K. Mulford Co., Philadelphia. (Jour. A. M. A., Jan. 17, p. 203.)

Ovarian Substance-L. and F. Desiccated.—The entire fresh ovary of the hog, freed of extraneous matter, dried and powdered without the addition of diluent or preservative. For a discussion of the actions and uses of ovary preparations, see New and Non-official Remedies, 1924, p. 220. The product is marketed in 2 and 5 grain capsules and in 2 and 5 grain tablets. Lehn and Fink, Inc., New York.

Ovarian Residue-L. and F. Desiccated.—The residue from the fresh ovary of the hog, after removal of the corpus luteum, dried and powdered without the addition of preservative or diluent. For discussion of the actions and uses of ovary preparations, see New and Non-official Remedies, 1924, p. 220. The product is marketed in the form of 5 grain capsules and 2 and 5 grain tablets. Lehn and Fink, Inc., New York.

Corpus Luteum-L. and F. Desiccated.—The fresh substance of the corporea lutea of the hog, dried and powdered without the addition of diluent or preservative. For a discussion of the actions and uses of ovary preparations, see New and Non-official Remedies, 1924, p. 220. The product is marketed in the form of 2 and 5 grain capsules and 2 and 5 grain tablets. Lehn and Fink, Inc., New York.

Proposote. — A condensation product of creosote and phenylpropionic acid. It contains the equivalent of 50 per cent of creosote. Proposote is not decomposed by the gastric fluids and passes the stomach practically unabsorbed. It is decomposed in the intestine and its components are chiefly eliminated through the kidneys, but it is claimed that a part of the liberated creosote is eliminated through the respiratory tract. Based on this latter elimination, the administration of proposote is claimed to be of value in bronchitis and coughs due to bronchial infections. Proposote is used for the same purposes for which creosote is administered. It is marketed in the form of capsules containing 5 and 10 minims, respectively. Parke, Davis & Co., Detroit.

Standard Radium Solution for Intravenous Injection, 5 micrograms Ra.—Each ampule contains radium chloride-Standard Chemical Co. (New and Non-official Remedies, 1924, p. 277) equivalent to 5 micrograms of radium element in physiological solution of sodium chloride, 2 c.c. Radium Chemical Co., Pittsburgh.

Standard Radium Solution for Intravenous Injection, 10 micrograms Ra.—Each ampule contains radium chloride-Standard Chemical Co. (New and Non-official Remedies, 1924, p. 277) equivalent to 10 micrograms of radium element in physiological solution of sodium chloride, 2 c.c. Radium Chemical Co., Pittsburgh.

Standard Radium Solution for Intravenous Injection, 25 micrograms Ra.—Each ampule contains radium chloride-Standard Chemical Co. (New and Non-official Remedies, 1924, p. 277) equivalent to 25 micrograms of radium element in physiological solution of sodium chloride, 2 c.c. Radium Chemical Co., Pittsburgh.

Iletin (Insulin-Lilly) U-10, 10 c.c.—Each c.c. contains 10 units of iletin (insulin-Lilly) (New and Non-official Remedies, 1924, p. 152). Eli Lilly and Co., Indianapolis, Ind.

Iletin (Insulin-Lilly) U-20, 10 c.c.—Each c.c. contains 20 units of iletin (insulin-Lilly) (New and Non-official Remedies, 1924, p. 152). Eli Lilly and Co., Indianapolis, Ind.

Iletin (Insulin-Lilly) U-40, 10 c.c.—Each c.c. contains 40 units of iletin (insulin-Lilly) (New and Non-official Remedies, 1924, p. 152). Eli Lilly and Co., Indianapolis, Ind.

Tincture Digitalis Purified (Fat Free)-S. and D.—A fat-free tincture of digitalis corresponding in strength to tincture of digitalis-U. S. P., containing 45 per cent of alcohol. It is standardized by the one-hour frog method of the U. S. Pharmacopoeia. The actions, uses and dosage are the same as that of tincture of digitalis U. S. P. Tincture digitalis purified (fat-free)-S. and D. was introduced at a time when the "fat" of digitalis was believed to cause gastric disturbances. At present this claim of superiority is not tenable and the preparation is sold simply as a standardized tincture of digitalis. Sharp and Dohme, Baltimore. (Jour. A. M. A., Jan. 24, 1925, p. 285.)

Antimony Sodium Thioglycollate.—A compound formed by dissolving antimony trioxide in a solution of a mixture of sodium thioglycollate and thioglycollic acid. It contains not less than 37 per cent of antimony. The actions and uses of antimony sodium thioglycollate are the same as those of antimony thioglycollamide, but it is more soluble and in higher doses appears to be less toxic. Hynson, Westcott and Dunning, Baltimore. (Jour. A. M. A., Jan. 31, 1925, p. 369.)

CASE REPORTS

CASE OF BILATERAL DERMOID CYSTS OF THE OVARIES

PERRY E. DUNCAN, M.D.
St. Paul

Mrs. F. W., a white, married woman, aged 18 years, was admitted to St. Luke's Hospital, November 1, 1924—a private case of Dr. L. M. Benepe. Her chief complaint was pain in the lower part of the left abdomen. There was nothing of importance in her family or past history. Her menstrual history was normal before the present illness.

Four months previous to admission, an abortion was performed. At this time she was told that she was three months pregnant, having missed the three previous periods. Since then she had complained of a dull pain in the left iliac quadrant, having been partially incapacitated for work during this period.

The physical examination was essentially negative except for the presence of a firm, rounded, smooth mass, movable, and about 10 cm. in diameter, situated in the left iliac fossa and to the side of the uterus. The uterus was essentially normal. The right ovary was in its usual position and seemed to be about twice the normal size. The preoperative diagnosis was hydrosalpinx.

At operation, November 7, 1924, the left ovary was represented by a tumor mass lying in the left iliac fossa. The right ovary also contained a yellowish cyst, through the wall of which some hair could be seen. The right and left tubes and left ovary were removed in the usual manner. The right-sided cyst was resected, leaving about what would correspond to one-eighth of a normal ovary.

Pathological Examination.—The tumor mass on the left measured 12x10x8 cm. It was smooth, glistening and of a reddish color and a fine tracery of blood vessels were seen over its surface. It was doughy in consistency and on section presented the appearance of an ordinary dermoid filled with hair, bone and sebaceous material.

The resected portion of the right ovary measured 6x4x3 cm. It was smooth, pale gray and glistening. On section, a cystic structure filled with sebaceous material and hair.

Areas from the tumor removed from the right ovary were lined with a stratified squamous epithelium. Numerous hair follicles were present. The yellow cystic areas seen on the gross were small cavities lined with stratified epithelium. Sections from the large cyst on the left showed a similar inner epidermal lining without papillæ, but with many hair follicles and sebaceous glands.

Comment.—This patient passed through an uncomplicated convalescence. The case affords a good illustration of the feasibility of conserving the ovarian substance when some normal tissue is present, thereby avoiding the danger and inconvenience of a premature operative menopause. The case also emphasizes the fact that the mistake in diagnosis would likely have been avoided if a competent radiographer had been called to assist in making the diagnosis. However, the treatment and results would have been the same.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:
F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH
THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

SOME OBSERVATIONS ON GASTRIC CARCINOMA: Martin B. Rehfuss (Medical Clinics of North America, November, 1924). The author submits the following data as the result of his observations.

The roentgenologic examination should include a careful fluoroscopic study not only of the antero-posterior position but the lateral one as well, so as to disclose lesions on the anterior or posterior wall.

An examination in the recumbent position is necessary in all doubtful cases to reveal lesions in the cardia, as well as to more perfectly visualize the pylorus.

In 95 per cent of cases the lesion gives roentgenologic evidence of its presence.

A negative defect in the stomach is always suspicious, even though it has the typical appearance of a healed ulcer.

Carcinoma of the stomach should be treated like an acute lesion, but with the demonstration of every gastric defect a routine Wassermann should be made.

From the standpoint of gastric chemistry Rehfuss suggests an examination of the fasting residuum for retention, microretention, pus, blood and organic acids. This is followed by a simplified test meal, preferably the Ewald meal, which will reveal pathologic exudates. He believes there is a tendency to generally lowered acid output up to total achlorhydria, increased soluble proteins, the presence of organic acids, a tendency toward the reduction of free hydrochloric acid and increased combined acidities, the presence of an increase in total and combined chlorides and the demonstration of pus and blood throughout the digestive period. In the majority of cases of malignant ulcer the hydrochloric acid reaches a high level. Two methods of analysis—chemical and roentgenologic—should be correlated, since they answer totally different questions; the *x*-ray, as to form, position, mobility and alterations in contour; the gastric analysis, through alterations in the gastric work and the evidence of exfoliation or exudation of pathologic products from the diseased area.

DR. F. J. HIRSCHBOECK.

A STUDY OF READMISSION AND RELAPSE OF TUBERCULOSIS IN 200 CASES OF EX-SERVICE MEN READMITTED TO THE NOVA SCOTIA SANATORIUM: A. F. Miller (American Review of Tuberculosis, 1924, ix, 561). During and since the war 1,338 ex-service patients were admitted to the Nova Scotia Sanatorium and 430 have been readmitted, many of them several times. This has afforded an unusual opportunity for following up the post-discharge history of military patients. In the present study of 200 readmissions 33 per cent had definite relapses while 67 per cent had no relapse. Some of those readmitted without evident relapse (39) were kept at the sanatorium only for a 2 weeks period of observation.

Study of the histories of the readmission cases proved interesting from two points of view: the medical and the economic. The symptoms were somewhat misleading inasmuch as many of them formerly considered as indicative or suggestive of tuberculosis are now known to be found in non-tuberculous or well-arrested cases. Eighty-nine per cent had cough, 84.5 per cent had expectoration, 84.5 per cent had pains in chest and 84.5 loss of weight and strength while 44 per cent had rise of temperature and 19.5 hemoptysis.

Dr. Miller believes that the presence and persistence of symptoms not accounted for by any medical findings may be due to a form of war neurosis. As was to be expected the incidence of relapse was lowest in the minimal and greatest in the far advanced group.

Twenty-seven per cent of the relapses were attributed to intercurrent respiratory disease, not including those in which "colds" were indirectly causative. A large percentage of the relapses were attributed to "unsuitable work."

According to Dr. Miller the question of support is the outstanding consideration in a study of readmission and relapse. If we had at the sanatorium some means for getting the patient to make his attempt at economic re-establishment in life, he could be kept there longer and be put more firmly on his feet before being sent out.

In conclusion Dr. Miller recommends as solution of the problem of relapse the industrial colony as carried on at the Papworth Estate in England. Here the hospital, the sanatorium, the training colony and the permanent settlement are parts of one excellent system for the care of the tuberculous.

A. T. LAIRD.

OCCUPATIONAL THERAPY IN THE SANATORIUM TREATMENT OF THE TUBERCULOUS: G. L. Bellis, M.D. (Archives of Occupational Therapy, 1924, iii, 363). Sanatoria are built and maintained for the purpose of giving to the tuberculous sick: first, the best possible opportunity for recovery; second, to teach the principles and practice of personal hygiene and sanitation; and third, to return to the community, if at all possible, a self- and perhaps a family-supporting citizen.

Thus the element of time is a most important factor in considering the welfare of all persons ill with tuberculosis.

From a meager beginning in 1915 by introducing the most simple arts and crafts work during medically prescribed exercise periods, the occupational therapy department at Muirdale Sanatorium now includes bedside instruction, shop work in the more advanced as well as the simple arts and crafts, kindergarten and graded school work for children, academic training for convalescing adults, and supervised recreation.

What have been its advantages to the patient and to the institution? Eight years at Muirdale have demonstrated that occupational therapy:

(a) Promotes recovery from tuberculosis by substituting directed and supervised physical activities for the undirected and unsupervised physical activities destructive of the benefits to be gained through sanatorium treatment.

(b) Promotes recovery from tuberculosis by substituting the normal mental activities of an industrious life for the abnormal mental activities of idle life, a pathogenic psychosis extremely common to all individuals sick or well deprived of useful occupation.

(c) Enables the child undergoing treatment to continue school work under the most hygienic conditions possible, thus gaining in mind as well as in body, and enables the convalescent adult to become educationally better qualified to "carry on" in his former vocation or to take up a line of work entirely new and more adaptable to his requirements.

(d) Increases the length of stay of patients at the sanatorium by adding to sanatorium life an interest that is extremely attractive and relieves to a considerable extent the monotony of cure-taking.

(e) Simplifies the problems of administration especially in the matter of discipline and promotes in no small degree a most wholesome institutional atmosphere.

A. T. LAIRD.

SURGERY

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FRACTURES OF SHAFT OF THE FEMUR: Campbell and Spud (Surgery, Gynecology and Obstetrics, November. 1924). The condition of fracture of the femur is one of the most serious problems the surgeon has to face and is high in the ranks of permanently disabling injuries.

The two best methods in use for treatment of the condition is gradual reduction by suspension and traction in connection with the Balkan frame, and immediate reduction and plaster cast. When properly used the cast is the most reliable method of fixation at our command.

The authors base their statements on treatment of one hundred and fifty-three cases of fracture of the shaft of the femur, together with personal observation and careful study of reported results in literature.

Fractures should be reduced as early as possible, as ill-placed callus interferes with reduction, swelling is pre-

vented, and no callus is wasted. Callus once broken up never forms as rapidly again, and repeated reductions and disturbances of callus are one of the most common causes of non-union. The middle third of the femur is the most common site for a fracture. The fracture is usually transverse or spiral. The deformity usually seen is for the shorter upper fragment to be displaced forward and slightly abducted, due to the pull of the psoas, iliacus, pectineus and abductors of the thigh. Interposition of muscles or fascial bands between fragments is a very rare cause for failure of reduction or non-union. The most common cause for non-union in simple fractures is lack of reduction.

One of the greatest objections to the plaster cast is that the knee and ankle joints are necessarily immobilized for a long period of time, therefore causing some atrophy of articular cartilages and contractures of soft parts about the joints, resulting in a certain amount of stiffness in all cases. About five per cent of the cases reported had some permanent loss of motion, and in a few it was sufficient to seriously impair the joint.

In reducing fractures of the femur an orthopedic table with the usual attachments for extension and countertraction is essential. Combined with this should be an *x*-ray equipment. The patient is given a general anesthetic, the fracture reduced, and the position checked by the *x*-ray and fixed. A plaster cast is applied, extending from the upper chest to the toes and affected side, and to the knee on the unaffected side. The cast is removed at the end of two weeks in children and three weeks in adults, the alignment of the leg carefully inspected, the position of the fragments checked by *x*-ray, and the joints gently manipulated. A second spica cast is then applied, usually only taking in the injured limb if there is satisfactory union and good position.

Open reductions are rarely indicated in acute fractures of the femur. Early reduction and application of cast is the method of choice unless there is excessive swelling when the case is first seen. If such be the condition, manipulation is delayed until swelling recedes. Compound fractures with infection are frequently followed by non-union, particularly where there is loss of bone. A compound fracture is therefore kept in extension splint until all chances of infection have subsided. If no infection has occurred at the end of ten days, the fracture is reduced in the usual manner and the cast is applied. If infection occurs, adequate drainage is established.

The immediate reduction and application of a cast is an ideal method of treatment in children because of the uniformly good results, the ease of handling and caring for the patients, and the certainty that the fragments cannot displace due to lack of co-operation. Immobility of joints over a long period of time is not a factor of serious importance in children. The authors find that the plaster method properly used gives as good or better results in adults than any other method. Autogenous bone grafts are the best method of internal fixation in connection with open reduction. Internal fixation is rarely indicated in children even in non-unions. It is indicated in mal-unions in adults when reduction is difficult to maintain and always indicated in non-unions in adults. J. W. Stinson, M.D.

ACUTE APPENDICITIS IN THE INFANT: Fenwick Beckman, M.D. (Annals Surgery, 1924, lxxx, 911-914). The author reports forty-three cases of acute appendicitis in children under five years of age, seen at the Bellevue Hospital, New York, up to 1916. This condition is rare and seldom occurs before the third year. Among the cases reviewed the youngest was twenty months. Ten of the patients were in their third year, nine in their fourth year, and twenty-three in the fifth year. Twenty-seven were males and sixteen females.

The mortality was 25.6 per cent, which is high in comparison with that in children of all ages (7.58 per cent in author's series). It proved 100 per cent in the second year, 60 per cent in the third, 22.2 per cent in the fourth, and 8.6 per cent in the fifth. Of the patients operated within twenty-four hours of onset of appendicitis, three had no perforation, twelve had localized abscesses, and were operated on an average of four days after onset of symptoms. Twenty-three had diffuse peritonitis with a period of three days elapsing before operation. There were ten deaths. Perforation tends to occur early in infants, and a high mortality follows spreading peritonitis. Of the ten who died of spreading peritonitis six had received castor oil, and two had been given frequent enemata.

Among the outstanding symptoms were noted vomiting (seen in 36 of 43 cases), pain, apathy, and prostration. Constipation usually occurs, but at times diarrhea is present. Abdominal respiration is unusual when peritoneal inflammation arises. At times abdominal rigidity is absent; however, it is present when there is peritonitis. Rectal examination is frequently valuable. Temperature of over 102.5 is seldom seen, although fever is usually present. Leukocytosis is usual.

The author concludes that acute appendicitis is rare in infants and is seldom seen before the second year of life. Mortality is relatively high due to the high percentage of early perforations and spreading peritonitis. Cathartics apparently precipitate perforation in many cases.

Jackson K. Holloway, M.D.

COEXISTING NEPHROLITHIASIS AND URETEROLITHIASIS ON OPPOSITE SIDES: W. Frank Fowler (Ann. of Surg.). In this paper the author cites a case in which this comparatively rare condition of nephrolithiasis and opposite side ureterolithiasis was found, and outlines means of diagnosis and treatment.

Braasch's findings were quoted in which only three such cases were found in a series of 450 operative cases.

He states it is not uncommon to find multiple stones in a kidney which appear as one by roentgenogram, and stresses the point that more careful search should be made of the kidney at time of operation to make certain that no stones are overlooked. This formerly was done by needling and digital examination, but at present the use of a fluoroscope at the time of operation is the method of choice and a careful check-up should be made before dismissing a patient.

Roentgenograms made of the urinary tract may frequently be misinterpreted unless supported by careful urinalysis and cystoscopy.

To prevent the formation of multiple stones or the destruction of kidney tissue, the author advises early operation, although he feels that watchful waiting is indicated in cases of small symptomless stones, as they not infrequently are passed spontaneously.

The differential diagnosis was also stressed.

Out of 484 cases that came to operation many had had appendectomies and other operations. In this group with left-sided renal calculi, twenty-one cases had had either an appendectomy or cholecystectomy.

The presence of pus cells or red blood cells in the urine should warrant an *x*-ray examination.

Pyonephrosis is usually secondary to a single stone, but multiple stones may be secondary to the inflammatory process set up.

The operation of choice in nephrolithiasis is undoubtedly a pelviotomy, as less kidney tissue is destroyed, but in some cases it is necessary to do a nephrotomy which may carry its complications as hemorrhage.

In sudden occlusion of one ureter, there may be no symptoms and 21 per cent make uneventful recovery; 15 per cent require later nephrectomy because of infection. In occlusion of one ureter only, there is a moderate hydronephrosis and the obstruction may be present ten days without kidney destruction.

In cases of ureteral obstruction the function of the kidney may be temporarily less than that of impaired kidney, and for this reason the author feels that the cases with nephrolithiasis with coexisting ureteral stones on the opposite side, the ureterolithotomy should be done first.

The possibility that strictures may form following ureterolithotomy justifies one in passing a ureteral catheter ten and twelve days postoperatively.

The recurrence of renal calculi should be less than 10 per cent, but many statistics show a much higher percentage and it is suggested that in some of these cases the stone found at a later date might have been overlooked rather than reformed.

It is true that stones may reform and require a second operation, but a third operation for renal calculi due to reformation is rare.

L. D. Powell.

BASIC PRINCIPLES AND SUPREME DIFFICULTIES IN GASTRIC SURGERY (Surgery, Gynecology and Obstetrics, January, 1925). This article is a review of 1,000 cases of dyspepsia, 250 of which were gastric or duodenal ulcers. After eliminating the reflex stomach group, spastic stomachs remained. These may be preulcerous. Duodenal and jejunal ulcers arise where the gastric juice impinges on the mucous membrane. Acid of the stomach is controlled by regurgitation.

In a few dilated stomachs without ulcer, resection and destruction of the sympathetics did some good. Ulcer operations should be accompanied by alkalinizing operations, such as pyloroplasty or gastro-enterostomy. In certain ulcer cases an operation called gastric exclusion was done if there was no occlusion of the pylorus. This consists of a Polya in which the pyloric end of the stomach is not resected but the incised end is inverted and sutured.

The low acidity in stomach surgery is apparently due to regurgitation, as both resection and exclusion operations gave the same acidity. Success or failure lies in causing good regurgitation. In the gastric ulcer stomach, which is large and relaxed, resection is the operation of choice. Gastro-enterostomy is contraindicated in these cases. Gastro-enterostomy failures are of two groups: (1) resulting hyperacidity with jejunal ulcer or recurring duodenal ulcer; (2) cases with marked alkalinization, regurgitation and bile, resulting in nausea and vomiting.

In duodenal ileus obstruction does not seem to be the main factor. Gastric exclusion by sectioning the pylorus and making a modified Polya seems the operation of choice.

In secondary operations on the gastro-intestinal tract Doctor Devine has developed a special retractor which holds back the skin edge and allows good exposure. He always empties a distended stomach by a trocar from behind through the gastrocolic omentum in these secondary operations. In gastrojejunal ulcer resection of the jejunum with removal of the stoma, and pyloric resection of the stomach, is his operation of choice.

J. C. Potter, M.D.

EXCISION OF THE CERVIX FOR ENDOCERVICITIS: Rattenberg and Schwartz (Surgery, Gynecology and Obstetrics, November, 1924). This author describes a technique for excision of the cervix in the treatment of endocervicitis. The distal end of an infected cervix shows marked inflammatory changes, but as the proximal end is approached near the internal os these changes are either barely perceptible or entirely absent, thus showing the efficacy of the surgical procedure described, so far as the removal of the infected area is concerned.

The operation consists of making anterior and posterior lips by an incision at the external os. Then one-half of the cervix, the entire granular area surrounding the upper portion of the cervical canal, is coned out. A vaginal flap previously liberated is then inverted into the hollowed out shell of the upper lip of the cervix and thus all the denuded areas are covered. The lower lip is then completed in a similar manner. The procedure cures the leukorrhea, does not interfere with normal dilatation during labor, and clears up the focal infection.

J. W. Stinson, M.D.

LATE RECURRENCES AFTER RADICAL OPERATION FOR CARCINOMA OF THE BREAST: George Woolsey, M.D. (Annals of Surgery, 1924, lxxx, 932-938). The author reports three cases of carcinoma of the breast recurring locally twelve to sixteen years after primary operation. While such late recurrences are rarely seen, about eighty-five cases have been collected by Ransohoff (1907, Annals Surgery, clvi, 72), and recently by the author.

Various explanations attribute local recurrence to cancer cells left at first operation. The author believes them to originate probably in the lymphatics of the underlying fascia, which have been permeated. Judd is quoted as saying, "Recurrences in the skin occur more frequently where a large amount of skin has been removed and the fascia saved, than where less skin was taken and a very

free dissection of the superficial and deep fascia was made."

Following removal of one breast for carcinoma, the patient is three or four times more likely to develop carcinoma in the opposite breast than a normal woman of the same age. Carcinoma cells, it is claimed, permeate some of the lymph passages which anastomose across the midline and may lie dormant until some stimulus arouses them to renewed activity. In fifteen cases where pregnancy occurred after removal of one breast for carcinoma, two to ten years previously, thirteen developed carcinoma in the remaining breast, and twelve of them died very promptly.

While it is too pessimistic to believe that we are never justified in pronouncing a patient cured of cancer after operation, yet intensive postoperative radiation is to be urged. It has been proved of definite value in preventing certain recurrences and in postponing the appearance of all recurrences.

JACKSON K. HOLLOWAY, M.D.

INTESTINAL OBSTRUCTION: Glover H. Cooper, M.D., and Barney Brooks, M.D. (Annals of Surgery, vol. lxxviii, December, 1923, No. 6, pp. 755-761). The following conclusions were arrived at following experimental work on dogs:

Animals with surgically closed, isolated loops of small intestine may live as long as two weeks. The fluid in the closed loops is very toxic and often several hundred times enough to kill a dog of equal weight in a few hours if injected intravenously.

Death may occur without any decrease in the blood chlorides. This fact differentiates an intestinal obstruction in the small bowel, from the so-called duodenal intoxication or obstruction in the duodenum or stomach. Administration of the NaCl in large quantities does not influence the manifestations of intoxication after intravenous injection of toxin.

The best management is early recognition of the condition and immediate surgical treatment.

Absorption of the toxin is promoted by any interference with the blood supply of the obstructed loop, such as strangulation or distention.

"The factors which influence absorption of toxin are of much greater importance in the cure of intestinal obstruction than the factors of production of toxin. When a patient has a certain dose in the circulation, there is no known method by which the damage done can be alleviated."

W. P. HERBST.

THE TREATMENT OF INFECTIONS—GENERAL, LOCAL, AND URINARY, WITH THE INTRAVENOUS INJECTIONS OF MERCUROCHROME: H. H. Young, M.D. (Surgery, Gynecology and Obstetrics, January, 1925). The author emphasizes the failures and successes of intravenous "220" therapy. An important observation is that those patients who have the greatest reactions obtain the greatest benefit. Big doses may be administered, 7.5 milligrams per kilo being the largest. There have been many startling cures by intravenous mercurochrome.

J. C. POTTER, M.D.

PEDIATRICS

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A STUDY OF PNEUMONIA IN INFANTS AND CHILDREN: Rudolph Duryea Moffett, M.D. (Archives of Pediatrics, November, 1924). Where digitalis is instituted early, there is never a sudden drop in the pulse rate nor is there a cardiac collapse, which so frequently occurs at the time of crisis. Instead of a sudden drop, the pulse continues regular, slightly lower, then gradually coming down to normal. Children with bronchopneumonia of the influenzal type are more acutely ill than those with lobar pneumonia; however, the mortality rate reported is less than in lobar pneumonia.

The presence of low leukocyte count with a small number of polymorphonuclears is usually an indication of poor resistance. In distinct lobar pneumonia the total white blood cells are uniformly much higher, varying from 25,000 to 40,000, while in the bronchopneumonias, with influenzal infection, they are between 10,000 and 20,000. During the period of acute illness, daily urine examinations should be made in all cases for the early detection of nephritis. Too much stress cannot be placed upon the importance of daily measuring the amount of urine excreted, as a lessened amount is often the first indication in the development of a kidney condition.

An *x*-ray examination of the chest should be made in all suspected cases of pneumonia. Early in the disease, when there is only dullness present, the *x*-ray picture reveals a dense area over the involved surface of the lung. In most cases of pneumonia, there is a small amount of pleural effusion. If a culture of the fluid contains the pneumococcus, there is no immediate need for draining the fluid, but if it contains streptococcus or staphylococcus, the condition is more urgent, as the infection is far more severe and should be drained before it spreads throughout the body.

Children are often injured by improper cold air treatment. Certain types of very robust children, well protected, especially about the head and chest, with proper blankets and hot water bottles to their feet, may withstand a colder atmosphere. The temperature of the room should never be below 55 degrees during the day and 45 degrees during the night. This makes for an even temperature without sudden changes from heat to cold. Children with pneumonia take nourishment poorly, consequently it requires persistent urging on the part of the nurse to make them take their food. The forcing of cooling fluids, such as orangeade, lemonade, and cool water as often as possible is very essential. When the temperature is above 103½ degrees, patients are given sponge baths every three hours, with water at 100 degrees. An ice bag is applied to the head and a hot water bag to the feet.

The most important form of treatment in pneumonia is early stimulation from the very onset of the disease. In using the tincture of digitalis, for younger children who are critically ill, a drop of the tincture is given for each pound of body weight in 48 hours. In two days the heart has become digitalized and the dose may be reduced to one-half. Camphor is second to digitalis in producing stimulation. Both digitalis and camphor should be used during the entire period of high temperature and should only be discontinued after the temperature has been normal for 24 hours. If stimulation is instituted early the heart muscle is better able to withstand the extra strain under which it labors.

R. N. ANDREWS, M.D.

A CLINICAL REVIEW OF INTUSSUSCEPTION WITH REPORT OF CASES: Eugene H. Smith, M.D. (Archives of Pediatrics, November, 1924). Intussusception is not a rare disease, yet its rate of incidence is such that the personal experience of the average physician is usually limited to comparatively few cases. The fact that instances occasionally occur in which the true nature of the trouble is not recognized, justifies the report of the small series of cases which follows. The further fact that a few hours' delay in making a diagnosis and in the institution of treatment may result in a tragedy, gives sufficient warrant for a clinical survey of this condition.

Onset: The time of onset can frequently be determined almost to the minute. An infant in apparently perfect health is seized while playing quietly on the floor, or is awakened from sleep, cries out sharply, and usually soon vomits.

Pain: Pain is present from the onset, is intermittent, and is usually so severe as to cause the child to cry out sharply, and for the moment to present the picture of extreme suffering, with drawn face, taut muscles, and perhaps profuse perspiration.

Vomiting: Vomiting occurs rather early, and usually comes on during or immediately following the paroxysm of pain.

Bloody Stools: A voluntary movement of the bowels may occur early. At first more or less normal fecal material appears, but within a few hours, blood in varying quantities is passed, either spontaneously or following the giving of an enema. In the rarer cases, in which no blood appears externally, its presence on the examining finger, following a rectal examination, should arouse suspicion as to the real nature of the trouble.

Tumor: The whole of the abdomen should be thoroughly explored, since the tumor may change its position from time to time, and may occupy any part of the cavity. If the child has an intussusception, the tumor is there, and every possible means should be used to detect its presence or absence. A rectal examination should always be made in cases in which any doubt exists. The presence of a cervix-like mass, with the typical slit-like opening, clears up any doubt as to the nature of the tumor, and sometimes reveals its presence, when, for any cause, abdominal palpation is unsatisfactory.

R. N. ANDREWS, M.D.

ROENTGENOLOGY

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PHOTOGRAPHIC DARK ROOM ILLUMINATION AND FLUOROSCOPIC DARK ROOM ILLUMINATION: By E. B. Knerr, M.D. (January Radiology, 1925, vol. iv, No. 1). Every dark room worker knows the use of the ruby red light in the dark room. A great advance over the ruby light has been attained in the substitution of green and yellow, combined by passing the light through screens of these colors.

The human eye is more responsive to green tinted illumination than to any other color, doubtless because of the influence of the green tints of natural surroundings. The trees, grass and other foliage have always been impressing their influence on the retina, whereas the red impression from natural sources is comparatively rare. The other old time thought was that the wall should be of a dark color, even black, but such is not the case. It should be painted white or gray as the walls will reflect only such rays as fall upon them from a photographic safe light. With such a volume of green light reflected from the walls and furnishings in the dark room the comfort as well as the efficiency of the operator's eyes is beyond comparison with that experienced through ruby or any other illumination.

The total darkness usually sought for in the *x*-ray fluoroscopic room is not necessary or even advisable. Much advantage may be secured to fluoroscopic observations by having the room faintly illuminated by a dull olive green light. It should be faint, but of sufficient intensity to make visible the objects about the room, and it should be continued during all fluoroscopic work.

The advantages that such illumination of the fluoroscopic room have for the operator, consultants and patient, are as follows:

1. Eyes accommodate more quickly.

2. The retina is rested for the particular tint of the actuated fluoroscopic screen and the contrast of its shadows deepens.

3. There is a more restful feeling for the patient as his eyes are accommodated to visible objects and he can see when green light is on.

4. When giving barium meals and sinus injections during fluoroscopic examination, assistants, nurses, and the technician can see what they are doing.

The light furnishing illumination should be so installed so as not to cast direct rays into the face of observers or upon the glass surface of the fluoroscopic screen. The principles of indirect illumination should be followed.

C. H. HAVER.

A CLINICAL STUDY OF SOME ANATOMICAL ABNORMALITIES OF THE COLON: Kantor (Am. Jour. Roent. 12: 414, Nov., 1924). Redundant colon is present in 9 to 14% of all persons and in 23% of all constipated individuals. It is more common in sthenic than in asthenic people.

Symptoms appear as a result of stress or abuse of colon function. They are chiefly constipation, gas distress and pain, while vovulus occurs rarely.

The diagnosis can only be made by the roentgen examination and is best done by use of the barium enema. The redundant loops are usually found in the descending and pelvic colons and may take various forms.

The therapy consists of restoration of colonic function by the usual methods and the author advises against surgery.

LEO G. RIGLER, M.D.

THE *X*-RAY APPEARANCES OF TUBERCULOUS JOINTS: R. W. A. Salmond (Tubercle (London), Dec., 1924, vi, 123). The channel of infection being the blood stream, it is important to know the distribution of the blood vessels at the end of the bones. The radiographic pictures differ accordingly as the joint is involved secondarily from a lesion in the bone near the epiphyseal cartilage or primarily from the synovial membrane. Primary bone disease is more common in children. A negative radiographic opinion should not outweigh a careful positive clinical one. Help may be gotten from screening the chest. Increased translucency or rarefaction of the bony structure is nearly constant in active tuberculous disease and is due to absorption of lime salts. All the bones of the subject may show it. Very rarefied bone is demonstrated with greater detail by the use of a suitable soft tube. The bones and soft tissues in the neighborhood of the joint show atrophy after a time. When the disease starts near the end of a long bone, no abnormal appearance is caused until the nutrition of the trabeculæ is interfered with, when an area of rarefaction appears. The irregular distribution of the granulations gives a worm-eaten and indistinct appearance to the bony structure. If a sequestrum is formed it appears as a lighter area lying loose in the area of rarefaction. Activity may sometimes be indicated by the lack of definiteness in the margin. Farther out reactive sclerotic osteitis may be indicated by a denser white area around the focus. Both osteoporosis and osteosclerosis may grow at the same time. Periarticular abscess may cause haziness around the joint.

When the disease starts in the synovial membranes for a time no changes are visible; later rarefaction of the bones occurs and the joint cavity shows increased density and becomes distended in outline. Eventually the articular margins show irregular and gouged out borders. After the bones are involved the appearances are much the same as in primary bone infection invading the joint.

In healed joints the appearance varies according to the amount of destruction. Complete bony ankylosis may occur. A healed joint loses most of the rarefaction and the structure of the bony trabeculæ becomes more definite as contrasted with the hazy, indistinct appearance of a still active lesion.

A. T. LAIRD.

THE DIAGNOSIS OF DILATATION OF THE BRONCHI IN CHILDREN BY MEANS OF THE INJECTION OF IODINIZED OIL: Armand-DeLille and Gelston (Amer. Jour. Dis. Child. 28: 527, Nov., 1924). In children the differentiation of bronchial dilatations from tuberculosis, pulmonary and supradiaphragmatic abscess, is often very difficult. The importance of this is obvious. The injection of iodinized oil into the bronchi, preferably by means of the tracheal route, followed by roentgenograms taken in the vertical and prone positions, will usually establish definitely the presence or absence of bronchial dilatations. A film of the uninjected lung should be taken previously.

Dilatations of the bronchi and bronchiectases manifest themselves as multiple shadows joined to a bronchus by a pedicle, as simple dilated bronchial shadows, or as enlarged shadows along the smaller bronchi. These can easily be distinguished from either parenchymal or pleural cavities.

This method, first described by Sergent and Cottenot, appears to be entirely harmless and, in fact, the presence of the iodine in the cavities seems to have some beneficial effect.

LEO G. RIGLER, M.D.

ERYTHEMA AS A UNIT IN DEEP ROENTGEN THERAPY DOSIMETRY: Leddy and Weatherwax (Am. Jour. Roent. 12: 514, Dec., 1924). Dosage in therapy is generally based upon the amount of radiation necessary to produce a skin erythema. This is such a variable and uncertain factor that it should be abandoned as a standard for dosage. Different degrees of redness can be produced by doses which vary by 50% without going beyond the classification of erythema. This leads to much confusion in attempting to standardize dosage in any condition.

The threshold value for erythema, that is the quantity of radiation which will just fail to produce erythema, is much more constant and more definitely ascertainable. Different degrees of redness cannot be measured but the difference between erythema and the absence of erythema is sharper.

The authors suggest that reports of dosage be given in full, including the time factor, and that the factors used be considered, rather than the percentage of skin erythema.

LEO G. RIGLER, M.D.

CIRRHOSIS OF LUNG: Saute (Radiology, Aug., 1924). Nine cases of pulmonary fibrosis, which the author calls "chronic diffuse interstitial fibrosis," are reported. The roentgen findings of most importance are a dense or mottled shadow involving the whole or part of one lung, elevation of the diaphragm, narrowing of the intercostal spaces, and retraction of the mediastinum and heart toward the affected side.

Most of the cases were due to pneumonia, or abscesses and plastic pleurisy following pneumonia. There is considerable discussion as to the etiology, especially as to the possibility of syphilis being a factor.

LEO RIGLER.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

PRACTICAL LECTURES. Delivered under the auspices of the Medical Society of the County of Kings, Brooklyn, N. Y. 1923-1924 series. 484 pages. 132 illustrations and 3 color plates. Cloth, $5.50. New York: Paul B. Hoeber, Inc., 1925.

AN AFRICAN HOLIDAY. Richard L. Sutton, M.D., Fellow of the Royal Geographical Society of Great Britain. 180 pages. 102 original illustrations. Cloth, $2.25. St. Louis: C. V. Mosby Co., 1924.

INFECTION, IMMUNITY AND INFLAMMATION. Fraser B. Gurd, B.A., M.D., C.M., F.A.C.S., Montreal. 329 pages. Cloth, $5.00. St. Louis: C. V. Mosby Co., 1924.

OPERATIVE SURGERY. J. Shelton Horsley, M.D., F.A.C.S. 784 pages. 666 original illustrations. 2nd edition. Cloth, $12.50. St. Louis: C. V. Mosby Co., 1924.

MEDICAL AND SANITARY INSPECTION OF SCHOOLS. S. W. Newmayer, A.B., M.D. Lea and Febiger, 1924. 462 pages. Price $4.00.

The experience of the author enables him to present the subject in an able and effective manner.

This small volume should be appreciated by those interested in school hygiene. The book is recommended to the school physician as a guide in constructing a Bureau of Hygiene. The school nurse will also find it a helpful aid in her duties.

Physical defects and communicable diseases receive special consideration. There are other chapters devoted to construction and inspection of grounds and buildings, medical supervision and mentality.

A. E. NICHOLS, M.D.

MANUAL OF THE DISEASES OF THE EYE. Charles H. May, N. Y. C. 445 pages. Illus. Cloth, $4.00. William Wood & Co. New York.

May's Manual of the Diseases of the Eye is, perhaps, more widely read by students of ophthalmology and general practitioners than any other book of its kind. The fact that it is now in its eleventh edition and has been translated into Spanish, French, German, Dutch, Japanese and Chinese is sufficient evidence of its merit. The present edition contains 374 original illustrations, 23 plates and 73 colored figures. It differs from its predecessor in that the chapters on uveitis and disturbances of mobility of the eye have been rewritten.

PAUL D. BERRISFORD, M.D.

PRINCIPLES OF BIOCHEMISTRY. T. Brailsford Robertson, Ph.D., D.Sc. Lea & Febiger. 1924.

The advances made in recent years in general medicine and allied subjects has been paralleled or even surpassed by the development of biochemistry. This book contains all the fundamental steps leading up to the establishing of biochemistry as a definite study and interpretation of life phenomena by the application of the known principles of chemistry and physics.

Robertson has not only by very intensive study and review of the literature, but also by his own experiments, managed to correlate and to establish biochemistry as a definite entity. The chapters on "Food" present a very thorough discussion of the chemical processes involved in the digestion and assimilation of the various elements of the diet and the elimination of waste material. The sections "The Properties of Protoplasm" and "Chemical Correlation of Tissues" discuss the various physiological processes from a biological standpoint.

This book fills a definite place in the progress of medicine and can be appreciated by the student, physician and scientist.

C. K. WILLIAMS, M.D.

A PRACTICAL COURSE IN STANDARDIZED PHYSIOTHERAPY, under auspices of Biophysical Research Department of Victor X-Ray Corporation, is now available to physicians. Offers a highly practical knowledge of all the fundamental principles that go to make up the standards of modern scientific physiotherapeutic work. Course requires one week's time. For further information apply to J. F. Wainwright, Registrar, 236 South Robey Street, Chicago, Ill.

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